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Lake Season Should Open on Time

With the Country at War, Study Should be Given to the Problem of Insuring
a Definite Date For Opening Navigation—What Would You Suggest?

THE few miles of narrow waterway extending from Whitefish Point to Detour, Mich., have been for years one of the principal arteries through which poured the raw supplies to feed the commercial life of the nation. As each day's developments drive home more clearly to each of us the immensity of the tasks which the war has placed upon this country, we realize as never before the vital need of keeping this short waterway open to navigation as many days as possible each year.

The government has shown a commendable, although possibly not a sufficient, appreciation of this importance by precautionary measures which have been taken to protect the Soo locks. Masters are warned to use discrimination in choosing their crews. Restrictions are laid down for protecting the locks from any enemy sympathizer who might be on the boats and thus be in an excellent position to wreck the canal structures, if the opportunity was permitted.

If it is important that the lake fleet be insured the fullest use of the Soo waterways in June, or August, or October, why is it not just as important to keep them open for navigation at other times, particularly the period from April 15, or earlier, to April 30?

Facing a 3,000,000-Ton Handicap

The advantages of opening navigation at a certain time each year, rather than depending upon the vagaries of the thermometer, need little emphasis. If any argument in favor of such a plan (granting its feasibility) were needed, the experiences of the past few weeks are conclusive. The lake fleet started its season confronted by a handicap of more than 3,000,000 tons of iron ore alone, with correlative disadvantages in the grain, coal, and package freight movement. Even if these paper losses are overcome later, and the fleet despite the belated opening of the season, matches its 1916 record, the importance of an early opening is not discredited. Proof would simply be afforded that the fleet could and would have moved that much more freight in 1917—and the country's business, both governmental and private, can assimilate

every pound of freight which the full lake fleet can possibly move.

The possible losses which a few weeks or even days delay in opening navigation imposes upon the business of the country can hardly be determined nor magnified. The pecuniary losses suffered by the lake interests themselves can be fixed with greater accuracy and just as certainly. The average opening of the lake season is between April 20 and April 25. In 1916, every channel on the lakes was open on April 23. On the same day this year practically every channel was blocked. As a result, the fleet which had been loaded with 1,658,411 tons of ore in April, 1916, took aboard only 211,532 tons in April, 1917.

"Ships everywhere and none able to move," is the way one vessel authority pictured conditions at the Soo on May 2. The financial loss suffered by the lake interests alone, while their fleets were in commission, but not in service, is sufficiently staggering to justify the opinion that it would be cheaper to adopt some method of taking the opening of the season out of the whims of chances and placing it in the hands of some mechanical agency that could furnish vessel men, and the country at large, some reasonable assurance of the ice barrier being broken at about the same time each year.

Ice breakers, such as unprogressive Russia has used so effectually in extending the open season at Archangel (which is beyond the Arctic circle) should prove an economical investment. The initial cost, the maintenance cost during the long months of idleness each year, all are far below the loss incurred in one busy season by a short delay.

Forward Your Opinion

Who should bear this expense? Should it be borne by private firms, by a community of firms, or by the government? *The Marine Review* believes these questions are of national importance, and should be given the widest discussions. Write us your views, pro or con, confidentially or publicly. With the country at war, a solution should be reached now so that any action, if necessary, can be taken in plenty of time.

Wooden Cargo Carriers for U.S.A.

Description of Proposed Standard Wooden Vessels to be Built for Government—Details of Contracts—Difficulties Must Be Overcome

WHAT are the facts regarding the government's ship building program? Hysterical articles in the daily press have led the public to believe that all the Allies' shipping problems are going to be solved through the immediate construction of a tremendous fleet of wooden steamships, which will be operated under the auspices of the United States shipping board. On the other hand, the country has been informed that the wooden ship idea is entirely chimerical. The opponents of the wooden ship idea point to the rapidity with which standardized steel ships may be constructed. They also advance numerous arguments against the wooden cargo carriers and claim to have Major General George Goethals, general manager of the United States Shipping Board Emergency Fleet Corporation on their side.

The facts of the case, however, seem to be that extensive programs for the construction of both steel and wooden standardized steamships will be put through by the government authorities as soon as possible. Those who are in close touch with the situation realize that every vessel that can be set afloat at the present time, whether it be wood, steel, concrete or anything else, is a tremendous asset. The cry all along the line on both sides of the Atlantic is for ships and yet more ships. Great as is the steel ship building capacity of the United States at the present time, it is not enough. Wooden ships must be called in to fill the breaches in the ranks of the world's merchant marine resulting from the ruthless prosecution of submarine warfare.

Shipping Men Are Not Fooled

The shipping fraternity is thoroughly cognizant of the weaknesses of the wooden cargo carriers. But shipping men also have a keen appreciation of the seriousness of the situation resulting from nearly three years activities of German submarines. Nor is the shipping world being fooled by the recent announcement that a method of exterminating submarines has been discovered. On the contrary, it is realized in maritime circles that, as yet, the only remedy in sight lies in the construction of just as many ships of all sorts as possible and it is thoroughly understood that the combined ship building resources of the United States, even after they are extended to their fullest extent, probably will not furnish enough tonnage to completely counterbalance the loss. The gov-

ernment, therefore, is going ahead with its wooden ship building program. It is now apparent, however, that it will hardly be possible to build 1,000 wooden ships in the next 15 months. If 200 or 300 vessels of this type are completed and placed in service in the time set, a tremendous task will have been accomplished.

Dimensions of the Boats

Plans for the new, standardized wooden steamships have been completed by the architects of the shipping board, and Theodore E. Ferris, 30 Church street, New York. The outboard profile and deck plans of the proposed steamers are shown on page 190.

The proposed government vessels will be 281 feet 6 inches in length overall. The length between perpendiculars will be 268 feet. Over the planking, the

beam of the new vessels will be 46 feet and their depth will be 26 feet. The vessels will be of the single deck type with open holds and shifting and 'tween decks. The new wooden steamers will have a total deadweight capacity of 3,500 tons on a draft of 23½ feet. The cargo carrying capacity will be approximately 3,000 tons.

To stiffen the hull, wing girder-keelsons will be installed in addition to the main center keelson. The hull also will be stanchioned with two rows of pillars. Further stiffness will be obtained by a system of diagonal steel strapping. The straps, which will be ½ x 4 inches in cross section, will go around the turn of the bilge. They will connect with a ¾ x 8-inch steel chord at the top.

No knees will be used in the construction of the hulls. Instead, the decks will be secured by clamps and shelf timbers. Two separate designs for the frames have been provided, one for yellow pine and the other for western fir. The timbers in the fir boats, of course, will be considerably larger than in those built of pine. The construction of each hull will require about 1,500,000 feet of lumber board measure.

As far as possible natural crooks will be utilized for the frames at the turn of the bilge. A great deal of sawed timber, however, will have to be utilized for this purpose.

Each vessel will have four hatches, two masts and eight cargo booms. The machinery and crew's quarters will be amidships. A forecastle head and poop deck also will be provided.

Steam Will be Used

Some of the boats may be powered by internal combustion oil engines, although the great majority will be fitted with steam power. The government is making arrangements to obtain triple expansion engines of the ordinary type or reduction-gear turbines for this purpose. The engines, or turbines, will deliver approximately 1,400 horsepower to a single screw. The screw will be 15 feet in diameter. It is expected that the boats will have an ordinary speed of 10 knots. In order to escape attack this speed may be increased to 11¼ knots by opening the by-passes between the high and low pressure cylinders.

Steam will be generated in water tube boilers operating under forced draft. Either coal or oil fuel will be utilized as circumstances may dictate. About 500 tons of bunker capacity is provided including 350-ton reserve bunkers. Each



WILLIAM DENMAN,
Chairman, United States Shipping Board

Contract for Construction of Proposed Wooden Steamers

CONTRACT
FOR CONSTRUCTION OF HULLS STANDARD TYPE
Fee Basis Bonus Clause

CONTRACT made this day of
between the

.....
party of the first part (herein called the Contractor) and the United States Shipping Board Emergency Fleet Corporation, a corporation of the District of Columbia, party of the second part (herein called the owner).

For valuable considerations and in consideration of the mutual promises of the parties, it is agreed as follows:

I Work To Be Done

The Contractor hereby agrees to construct in accordance with the drawings and specifications hereto attached and hereby made a part of this contract, under the Rules and Regulations of the American Bureau of Shipping, prescribed for the highest classification, wooden hulls suitable for cargo vessels. The Contractor agrees to deliver said hulls to the Owner afloat at the works of the Contractor at on or about the following dates:

The Owner may from time to time by instruction in writing, make such changes and alterations in the drawings and specifications not materially affecting the general design of the vessels as it may deem necessary. If such change shall delay completion of the work then the Contractor is to be allowed additional time sufficient to cover such delay.

II Payment

The Owner in consideration of the performance of this agreement by the Contractor agrees to reimburse the contractor for the actual cost of the work and to pay the Contractor for its services a fee of twenty thousand dollars (\$20,000) per hull.

For the purposes of this contract, the actual cost shall be generally as defined in the United States Revenue Bill of September 8th, 1916, Section 302, insofar as the requirements of said Revenue Bill are applicable to and not inconsistent herewith.

The actual cost shall include the following and items similar thereto in principle, provided that all items of overhead or indirect cost included in paragraphs (b) to (e) of this article and all items under paragraphs (f) and (g) shall as far as possible be submitted to the Owner in advance for its approval, and no item so submitted in advance and disapproved by the Owner shall be payable to the Contractor:

(a) The cost of labor and materials, machinery, equipment and supplies entering into the building, or construction of the vessel and other direct charges.

(b) A proper proportion of running expenses, including ordinary rentals, cost of repairs and maintenance, light, heat, power, insurance (including liability and compensation insurance) management, salaries, and other indirect charges.

(c) A proper proportion of interest accrued and paid on debts or loans, contracted to meet the needs of the business and the proceeds of which have been actually used to meet such needs.

(d) A proper proportion of taxes of all kinds accrued and paid with respect to the business or property.

(e) A proper proportion of losses actually sustained in connection with the business, including losses from fire, flood, storm, riot, vandalism, any act of God, acts of war, or other casualties, and not compensated for by insurance or otherwise.

(f) A reasonable allowance, according to the conditions, for depreciation of values of plant and property (account being taken of exceptional depreciation of extensions, increases, and additions to plant and property specially acquired

for or devoted to the manufacture or erection of the work or the construction of the vessel under this contract provided the same have not been paid for by the Owner under (g).

(g) The cost of labor, materials, machinery, equipment and supplies (other than real estate) for the establishment of and extensions, increases and additions to plant and property of the Contractor authorized by the Owner specially acquired for or devoted to the building or construction of the vessels under this contract and rentals actually paid for such establishments, extensions, increases and additions authorized by the Owner.

The fee for services shall be paid on each hull on delivery of the hull to the Owner afloat.

Physical property represented by items of cost included in paragraph (g) *supra* paid for by the Owner shall continue to be Owner's property after termination of this contract, but may be purchased by the Contractor at such termination at a valuation to be agreed upon.

Determination of Cost

The determination of the actual cost as above defined shall be made by and under the direction of George W. Goethals, as general manager of the Owner, or his successors in such office (herein called the General Manager) and his decision shall (except as hereinafter stated) be binding on both parties. Wherever possible, he will lay down in advance the methods to be followed in ascertaining and determining the actual cost, and where this cannot be done, will act on claims submitted by the Contractor. He will determine methods to be followed by the Contractor in preparing bills and by engineers and auditors in certifying to them, and will determine the items which must be referred for his decision. He will so far as possible determine in advance the ratio of amortization referred to in paragraph (f) *supra*, and allowances to be made for indirect charges.

Naval Architect

The Owner will employ one or more inspectors of recognized ability in their profession to supervise and assist in the construction of these vessels or hulls. They and their assistants, described herein as the Owner's inspectors, will represent the Owner and will be required to watch closely the construction. Such one of them as shall from time to time be so designated by the Owner will act as the representative of the Owner and to him shall be referred all questions arising under the contract at the works. His decision on all questions when rendered under his general authority or after approval by the Owner shall be binding subject in all cases to appeal to the General Manager of the Owner.

Auditors

The Owner may send an auditor to the works of the Contractor to supervise and assist in the accounting.

The accounts and records of the Contractor shall at all reasonable times be open to inspection by the Owner. All statements and accounts relating to expenditures and cost hereunder shall be made by the Contractor in such form as may be required by the General Manager. No change shall be required in the present methods and principles of keeping costs by the Contractor provided the General Manager deems them adequate for the determination of actual costs. All information obtained from Contractor's accounts and records shall be treated as confidential.

Time of Payments

Payments shall be made to the Contractor by the Owner monthly within 15 days after the submission of bills to cover the approved actual cost for the previous months as defined under paragraphs (a) to (e), inclusive, and together with the additional approved actual costs as defined under paragraphs (f) and (g).

No payment shall be made except when bills are certified by one of the Owner's inspectors or an auditor. Final approval of all bills by such inspectors or auditors shall be necessary for payment.

Title to Property

The vessels as they are constructed together with all materials, machinery, equipment and supplies brought upon the

(Concluded on page 193)

Contract for Construction of Proposed Wooden Steamers

(Concluded from page 192)

premises of the Contractor where the work of construction is being done, shall, as from time to time paid for immediately become the property of the Owner.

Bonus and Liquidated Damages

Should the Contractor succeed in delivering any of said hulls to the Owner complete before the dates above provided, the Owner agrees to pay as premium for earlier delivery for each completed hull so delivered, the sum of two hundred dollars (\$200) per day for each and every day gained by such early delivery. Should the Contractor fail to deliver any of the hulls on the dates herein fixed, the Contractor agrees to pay to the Owner (as liquidated damages) on each such hull two hundred dollars (\$200) for each and every day of delay in delivery of such hull, but it is hereby agreed that the total liquidated damages or premiums so to be paid shall in no case exceed the sum of for any such hull. Premiums or liquidated damages shall be added to or subtracted from the final payment of fees for services hereunder.

III

Materials

The materials to be used by the Contractor in the construction of the vessels under this contract, shall be of quality and characteristics best adapted to the purposes for which they may be used, and shall conform to the specifications annexed to this contract. The materials and workmanship used and applied in construction hereunder shall be first class and shall from beginning to end be subject to inspection of the Owner's engineers. Such engineers shall at all times during the progress of the work have full access thereto.

Orders

The owners shall have full control of all orders for materials, machinery, equipment, supplies and other purchases and commitments made under this agreement (including establishment of extensions, increases and additions to plants and property) and all contract and orders placed by the Contractor shall be in the name of the Owner by the Contractor as agent, and it is understood that the Contractor shall assume no pecuniary liability under or by reason of such obligations where made with the written approval of the Owner.

The number and class of men engaged on the work (including establishment of extension, increases and additions to plant and property), the hours of labor, methods of work and terms of employment shall be subject to the approval and direction of the General Manager of the Owner.

IV

Fire Protection

The Contractor shall provide adequate fire protection in the way of pumps, hydrants, hose, etc., to the satisfaction of the Owner's engineers, and maintain an adequate system of watching to comply with ordinary Underwriters' requirements (such expense to be an item of actual cost as herein defined).

Insurance

The Contractor will during the progress of the work on said vessels and until delivery of them place and maintain insurance on each of them in proper amount by companies approved by the Owner to cover work done and materials on hand for or appropriate to the use of the vessels in and about the premises of the Contractor. Such insurance shall provide against fire and marine risks, lightning, settling of stocks, breakage of ways, and risks of launching and shall be for an amount to be fixed by the Owner, not less than the sum of the payments made under this contract from time to time provided that the amount of insurance required shall not at any time exceed the amount available in the insurance market. The policies shall provide that the loss, if any, shall be paid to the Owner for the use of the Owner and the Contractor as interest may appear.

V

Liens

The Contractor shall keep the vessels in course of construction free and clear from all claims, liens or any encum-

brances of any kind or description and shall before delivery show to the satisfaction of the Owner that the vessels are free and clear from every claim, lien and encumbrance except claim or lien of the Contractor.

VI

Forfeiture

In case of failure or omission of the Contractor at any stage of the work prior to completion from any cause or causes to go forward with the work and make progress towards its completion satisfactory to the Owner, the Owner may declare this contract forfeited. In that event the Owner may immediately enter the works and premises of the Contractor and take possession of the vessels and materials and equipment. The Owner shall thereupon cause to be taken and filed with the United States Shipping Board a full and complete statement and inventory of all work done or begun on or about the vessels and of all materials on hand applicable thereto. On filing of such statement and inventory with the United States Shipping Board, the Owner may proceed with the completion of the vessels in accordance with this Contract either at the works of the Contractor with its equipment, yard and facilities or elsewhere, by contract or otherwise, and in its discretion use for this purpose all suitable materials on hand and included in the inventory. In case the Owner shall thus cause this contract to be forfeited, the amount to be paid hereunder shall be the actual cost (as defined in Article II hereof) of the Contractor plus a reasonable rental for the appliances, yards and facilities of the Contractor which, after said forfeiture, are used by the Owner.

VII

Assignment

This contract shall not, nor shall any interest herein, be transferred by the Contractor to any other person or persons save with the consent of the Owner from time to time obtained.

VIII

Disputes

If any doubt or dispute arises as to the meaning or effect of this contract, or the drawings or specifications which are a part hereof, or if any discrepancy occurs, the matter shall be promptly referred to the General Manager and his decision in the premises shall be conclusive and binding upon both parties.

In case after delivery of a completed vessel to the Owner under this contract (but only in that event) the Contractor shall deem that it is aggrieved by any decision of the General Manager either as to actual cost or as to any disputed matter hereunder of any kind and shall give notice to the Owner to that effect within 30 days after delivery or after final payment by the Owner, such matter shall be determined by a Board which shall consist of three naval architects or engineers or experts to be appointed, one by the Owner, one by the Contractor, and one by the American Bureau of Shipping. Such Board shall within 30 days after submission of such matter to it determine what if any further sum shall be due by the Owner to the Contractor hereunder on account of such delivered vessel and its finding (made by a majority of the Board) shall be conclusive on both parties.

IN WITNESS WHEREOF the parties have caused these presents to be executed by their proper corporate officers and their corporate seals to be hereto affixed and attached on the day above stated.

By

Attest:

Secretary.

UNITED STATES SHIPPING BOARD
EMERGENCY FLEET CORPORATION,

By

Attest:

Secretary.

vessel will have accommodations for a crew of 30 men. Additional accommodations for 12 gunners will be provided and the guns will be mounted fore and aft.

The vessels will be electric lighted and fully equipped with wireless and other protective devices.

Up to the time this article was prepared contracts for the construction of these vessels had been let by the Emergency Fleet Corporation to The Foundation Co., New York, Sanderson & Porter, New York, and T. C. Desmond & Co., New York. The Foundation Co. and Sanderson & Porter both have had extensive experience in the general construction field. The two Sanderson & Porter yards will be located on Gray's Harbor and Willapa Harbor, Washington, respectively. These two harbors are adjacent to the greatest lumber produc-



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GENERAL GEORGE W. GOETHALS
General Manager, United States Shipping
Board Emergency Fleet Corporation

ing region in the world. It is stated that the Sanderson & Porter yards will each have sufficient capacity for the construction of 20 vessels at one time. It has been announced that the Foundation Co. expects to locate one of its wooden ship building plants near New York City. Another may be operated near San Francisco. This company expects to employ 3,000 men in the construction of wooden vessels.

Thirty vessels are said to be covered by the contracts awarded to T. C. Desmond & Co. These vessels, it is stated, will be constructed at yards owned by the company at Essex, Mass., and Thomaston, Me. It is possible that another yard will be built near New York City.

The contract under which the government proposes to have its wooden ships

built is interesting. This contract is published in full on pages 192 and 193. According to the terms of the contract, the ship builder will be reimbursed for the actual cost of the work, plus a fee or profit of \$20,000 per hull. This covers the construction of the hulls only. The machinery will be installed under separate arrangements. The contract goes into detail as to cost items and in addition to direct labor and material costs, the ship builder is authorized to charge a proper proportion of his overhead expenses to the government. The government proposes to reimburse the contractor for losses which he may incur from fire, flood, storms, riots, etc. Allowances also will be made for depreciation and for the cost of plant extensions necessary for the expeditious construction of the government's vessels.

The contract provides for monthly payments to the ship builder within 15 days after the submission of bills to cover the accrued actual cost for the previous month. A bonus of \$200 per day will be paid for every day gained over the time specified in the contract; conversely, a penalty of \$200 per day will be exacted for each day's delay beyond the specified contract time.

Goethals Will Decide

The contract also provides that all disputes shall be referred to the general manager of the Emergency Fleet Corporation for decision. The ship builder, however, has the right to appeal to arbitration in case, after the completion of the vessel, he feels that he has been injured by the decision of the general manager. Such appeals will not be considered until the boats are completed and delivered. The arbitrators are to be appointed in the usual manner. It has been officially announced that all of the vessels to be built will be constructed under the contract system and that the government will build no vessels itself.

Under the existing plans, the ship builder will construct the hulls complete but will not install the engines or boilers. These will be furnished direct by the government and will be installed at the central fitting out station which will be provided at convenient points along both coasts. The ship builder will be required to furnish all the lumber, fastenings, paint, rigging, fittings, electrical equipment, etc., for the hull. The contract, however, provides that the government will have full control of all orders for material, machinery, equipment, supplies, etc., this provision being inserted to insure the delivery of materials of satisfactory quality. It is expected that the hulls constructed under this arrangement will cost about \$70 per ton, or \$210,000. The machinery, it is believed, will cost \$100 per horsepower or \$140,000 in addition. The total cost of each ves-

sel will probably range from \$360,000 to \$400,000.

To build the hull of a vessel of this character, ship builders estimate that the labor of 120 men will be required for four months. On the New England coast where smaller crews are worked, it is believed that seven months may be necessary for the construction of a hull, employing 60 men. The efforts of over 40,000 men, therefore, would be required to turn out the hulls alone at the rate of 1,000 a year. Probably an equal number would be engaged in making and in-

Most Favored Contract

The complete contract for the construction of wooden hulls of the standard type adopted by the shipping board, shown on pages 192-3, is the most favored form of contract. Other contracts may be approved, but an effort will be made to have all contracts follow the lines of the one shown.

After pointing out that the wooden hulls must be constructed in accordance with the rules of the American Bureau of Shipping, the contract discusses the form of payment. The government agrees to pay the actual cost of the work plus a fee of \$20,000 per hull. The actual cost is to include: The cost of labor and material, machinery, equipment and supplies; a proper proportion of running expenses; a proper proportion of interest accrued and paid on debts and loans contracted to meet the needs of the business; a proper proportion of taxes of all kinds; a proper proportion of losses actually sustained; a reasonable allowance for depreciation of values of plant and property; the cost of labor, materials, machinery, equipment and supplies (other than real estate) for establishing and increasing the plant and property of the contractor which is acquired for or devoted to the construction of vessels under this contract.

Maj. Gen. George W. Goethals has the authority to determine the actual costs. Payments will be made monthly within 15 days after the submission of bills. A premium of \$200 a day is provided for each day gained in delivering the vessel, and a penalty of \$200 a day for each day's delay in delivering the hull.

stalling the machinery. These figures give a glimpse of the magnitude of the government's program.

Before the plans of the shipping board can be carried out in their entirety, the labor problem must be solved. It has been stated that the department of labor has succeeded in registering 15,000 skilled shipwrights for work on the government's wooden fleet. It is not stated, however, how many of these men already are employed on construction of this character. Probably the majority

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How Wooden Ships Are Built--I

First of a Series of Articles Covering the Details of
Wooden Ship Building—Typical Methods of Construction

By H. Cole Estep

WOODEN ship building is a lost art that the gods of war have decreed must be revived. For the ranks of "the little cargo boats, that sail the wet seas round" are thinning fast as a result of the continual depredations of the slinking submarine. The dingy tramps of the ocean lanes, England's and America's pride, are threatened, and unlike the situation described by Kipling in 1894, the man-o'-war has found himself unable "to up an' fight for them" with any degree of success. Therefore, while a method of exterminating the German pest is being evolved, and long after the last one has been swept from the seas, ship builders everywhere will be obliged to proceed at top speed to provide vessels sorely needed by the world's commerce. And for a decade at least, the steel ship building capacity of the world will be insufficient to meet the demand, with the result that the builders of wooden cargo carriers are assured of a long period of prosperity and profitable activity.

No one with sense contends that the wooden ship is the equal of its steel counterpart. But

we are now face-to-face with a great national emergency. The wooden vessel, therefore, finds that its usefulness for the time being is not measured by intrinsic merit. Also, the conditions surrounding the world's carrying trade are such that the future of the wooden vessel is secure for the next 10 or 20 years regardless of whether the government's ambitious program is carried through. Those people who depend on the newspapers for their information think that the plan to build wooden ships for the transatlantic trade is a brand new idea. Well informed shipping men, however, know that wooden ship building has been undergoing steady expansion for the past year and a half and that American wooden ship builders today have orders for over 150 vessels for private owners.

As a result of this activity, there has grown up a demand for information of a practical character on wooden ship building, which it will be the purpose of the series of articles of which this is the first to supply. Numerous other articles, profusely illustrated and going into details, will follow this introductory installment.

HOW large may wooden vessels be built? This is one of the first questions that arises in considering the construction of wooden cargo carriers, for the economies of large units are thoroughly appreciated throughout the maritime world. In the heyday of the wooden ship, in England and Europe about 1850, very few vessels larger than 2,000 tons were built, and practically none were over 40 feet beam. Their length was usually about 200 feet. Their tonnage was limited by the fact that the naturally crooked oak timbers used for the frame grew only in limited sizes. The same limitations existed in regard to long timbers, such as keels, keelsons, strakes, clamps, shelves and planks, which had to be built up and well scarfed, locked, hooked and bolted to make up for lack of large size material. It remained for the Pacific coast of the United States with its boundless supply of timbers of the

largest sizes, to finally demonstrate that wooden vessels of 3,000 to 3,500 or even 4,000 tons deadweight capacity are practicable, although there is a difference of opinion among architects as to the extent to which the largest hulls should be reinforced with steel. At the present time, two wooden vessels, 308 feet long, 285 feet keel, with a deadweight capacity of 4,300 tons, not including 2,500 barrels of oil fuel for diesel engines, are under construction on the north Pacific coast. These vessels have been given the highest rating, it is stated, by

both American and British classification societies. Conservative opinion, however, leans to the view that vessels without steel reinforcement should not be built over 260 or 270 feet in length.

As far as the supply of lumber for wooden ship construction is concerned, there is little to fear. The estimated total supply of merchantable timber in the United States is placed at the stupendous figure of 2,500,000,000,000 feet board measure—over two-thousand billion feet. Canada, in addition, has 80,000,000,000 feet. Russia has

even more timber reserves than the United States. A large portion of the ship building timber in this country is in the Pacific northwest, the state of Washington alone having over 11,700 square miles of standing timber, exclusive of national forest reserves. In the south, along the gulf and southern Atlantic coasts, there are almost equally important timber reserves.

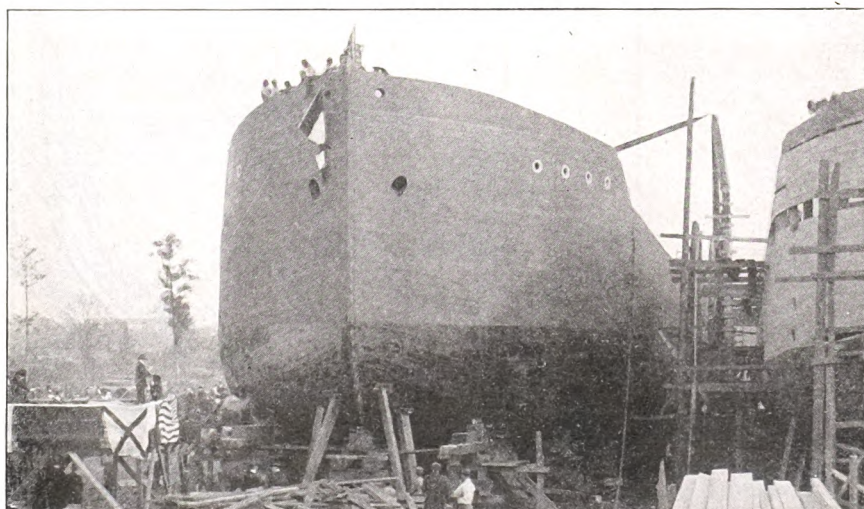


FIG. 1—LAUNCHING A LARGE WOODEN STEAMER AT A SHIP YARD NEAR NEW ORLEANS

wooden steamers to be built for the government under the auspices of the United States Shipping Board Emergency Fleet Corporation.

Wooden Cargo Carriers for U. S. A.

(Concluded from page 194.)

of them are so occupied, because there are now over 150 wooden vessels under construction in the United States. Even if all of the carpenters that the department of labor claims to have rounded up could immediately be set to work, the government would still be short some 25,000 men.

One of the large New York contracting firms sent a representative to the Maine ship building district early in May. After 10 days effort he was able to obtain the services of only about a dozen skilled shipwrights. In other words, the difficulties in the way of the solution of the labor problem are tremendous. It is self-evident that thousands of men who are not now even interested in wooden ship building, must be educated in the art before even half of the government's program can be put through.

The lumber and machinery situations are equally complicated. The saw mill capacity of the country will be severely taxed, although it is believed that it will be easier to solve the lumber problem than to obtain the necessary number of engines and boilers. All of the marine engine builders in the country are already working to the limit of their capacity on machinery for steel ships now under construction. In order to turn out a large number of wooden vessels, therefore, marine engines must be built by steam engine builders who heretofore have paid no attention to this kind of work. There are, however, in the United States, a number of large engine builders who could readily turn a portion of their energy to the construction of marine equipment. These firms have had experience in building heavy duty engines for rolling mills and other service and they can hardly be classed as amateurs.

The Dominion of Canada also expects to build wooden vessels to help combat the submarine menace. A \$10,000,000 loan has been floated for this purpose. These ships will be practically the same size as those to be constructed in the United States. They will be somewhat differently arranged, however, in that the machinery, it is stated, will be placed in the stern as in lake vessels. It is believed this will avoid difficulties which might ensue from the hogging or sagging of the hull. The propeller shaft of the Canadian vessels will be short and there will be comparatively little danger of the bearings getting out of align-

ment. It is said, the Canadian ships will be fitted with 2,000-horsepower engines and water tube boilers.

In addition to the wooden ship program, plans are rapidly being completed for the construction of standardized steel ships throughout the country. It is expected that a design for a standard steel ship will be announced shortly. Some of the proponents of the standard steel ship idea, however, do not realize that although the steel production of the United States is tremendous, the ship-plate rolling capacity of the country is definitely limited to the output of a comparatively small number of wide plate mills. In spite of these difficulties, how-

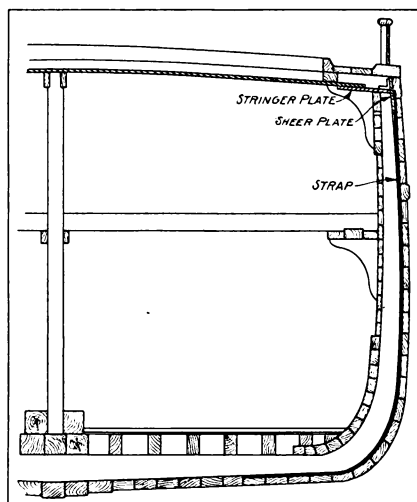


FIG. 6 — CROSS SECTION SHOWING METHOD OF REINFORCEMENT PATENTED BY FRANK E. KIRBY

ever, all authorities are agreed that every effort should be made to expedite the construction of steel vessels, because, as stated at the outset of this article, the cry is for ships and yet more ships in unlimited quantities.

To Build Wooden Ships in Texas

C. O. Yoakum, of the Kirby Lumber Co., Houston, Tex., and J. W. Link and associates, also of Houston, expect to start a large yard for building wooden ships at Houston at an early date. Beaumont, Tex., also is being considered as a site for the yard. The plans call for auxiliary schooners of 1,200 to 3,000-ton deadweight capacity. Messrs. Yoakum and Link, with their engineer, Capt. T. J. Anderson, Fox building, Galveston, Tex., recently made an extensive trip through the industrial sections of the United States for the purpose of purchasing equipment for the new plant and obtaining information relative to the field for wooden ship building. Both Houston and Beaumont are advantageously situated on deep water and Mr. Yoakum and his associates have

already secured control of a large tract of water front property at Houston.

The Kirby Lumber Co., which will be called upon to furnish the raw materials for the new project, operate a number of large saw mills in the south, having 12 saw mills in eastern Texas. Some of the vessels to be constructed at the new ship yard will be used by the Kirby company to carry its own product to Caribbean, Central and South American ports. The lumber company exports about 300,000,000 feet of lumber annually, and has been hampered recently by a shortage of bottoms. It is probable, also, that additional vessels will be built for sale and some work may be done for the United States government.

Order Five-Master

Balfour, Guthrie & Co., Portland, Ore., have contracted with the St. Helens Shipbuilding Co., St. Helens, Wash., for a 5-mast schooner, with topmasts, to be a duplicate of the schooner COLUMBIA RIVER, which was built last year.

The determination to equip fore-and-afters with topmasts is growing among some owners, who, in fact, advocate carrying topsails even on those ships equipped with auxiliary power. The ship contracted for is to have only sail power, no engines being contemplated, and she will be about 225 feet on the keel, with beam of 42.6 feet and depth of hold of 21 feet.

Starting with the British schooner DAVID EVANS, which was purchased from Americans about two years ago, Balfour, Guthrie & Co., have added steadily to their fleet.

New Texas Yard

McBride & Law, Beaumont, Tex., have started to build a plant for building wooden ships. They are equipping a yard to turn out vessels of from 500 to 2,000-ton deadweight capacity.

Six freight steamers costing \$4,000,000 were contracted for recently according to a statement by Daniel J. Hanlon, president of the Hanlon Dry Dock & Shipbuilding Co., Oakland, Cal., who had just returned from a business trip to New York. Of the new vessels, two will be 7,630-ton steel freighters.

The Ward ship yards at Olympia, Wash., will be enlarged to almost double the present area and capacity. The improvements are being made to handle any work that may be asked for by the government, according to an announcement by Manager E. R. Ward.

F. H. Dietz has resigned as general passenger agent of the United Fruit Co., 17 Battery place, New York, effective at once.

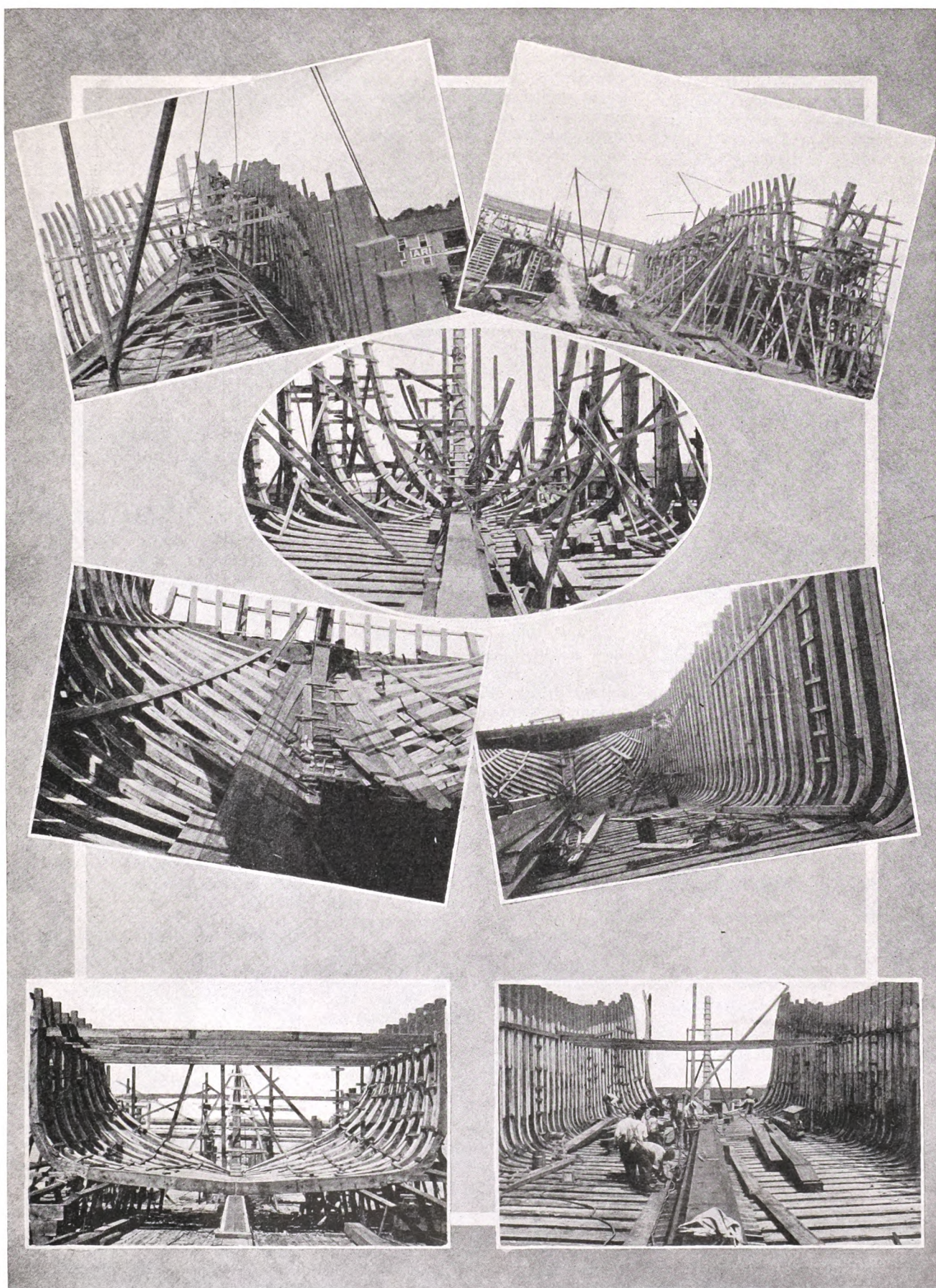


FIG. 7—TYPICAL CONSTRUCTION VIEWS IN A SOUTHERN WOODEN SHIP BUILDING YARD

Many Pacific Ship Builders Organize

In a period of less than a year, 40 new ship building companies have been organized in Washington, with an aggregate capital stock of more than \$17,000,000. The capital stock of these companies ranges from \$5,000,000 for the Skinner & Eddy Shipbuilding Co., Seattle, one of the pioneer companies, to \$10,000, the capital of the Seaborn Shipyards Co., Tacoma.

Following is the list of companies, complete to April 30, organized during the past year, with their place of business and capital stock:

Aberdeen Ship Building Co., Aberdeen, \$20,000.
 Motorship Construction Co., Portland, \$75,000.
 American Ship Building Co., Spokane, \$1,500,000.
 Skinner Syndicate, Seattle, \$50,000.
 Seaborn Shipyards Co., Tacoma, \$10,000.
 Vancouver Ship Building Co., Seattle, \$500,000.
 Olympia Ship Building Co., Olympia, \$50,000.
 North-western Ship Building Co., Tacoma, \$100,000.
 Deep Sea Ship Building Co., Seattle, \$50,000.
 Temple Ship Building Co., Seattle, \$100,000.
 Ames Ship Building Co., Seattle, \$500,000.
 Hoquiam Ship Building Co., Hoquiam, \$50,000.
 Pacific Ship Building Co., Tacoma, \$100,000.
 Tacoma Ship Building Co., Tacoma, \$300,000.
 Washington Ship Building Co., Tacoma, \$500,000.
 Erickson Ship Building Co., Seattle, \$500,000.
 Peoples Ship Building & Construction Co., Tacoma, \$250,000.
 Anderson Ship Building Co., Seattle, \$1,000,000.
 National Ship Building Co., Seattle, \$40,000.
 McAteer Ship Building Co., Seattle, \$100,000.
 Western Ship Building Corporation, Seattle, \$500,000.
 Skinner & Eddy Ship Building Co., Seattle, \$5,000,000.
 International Ship Builders, Olympia, \$500,000.
 South Bend Ship Building Co., South Bend, \$200,000.
 United Ship Building Co., Seattle, \$500,000.
 Washington Overseas Ship Building & Construction Co., Seattle, \$1,000,000.
 Raymond Ship Building Co., Seattle, \$250,000.
 Columbia River Ship Building Co., Portland, \$50,000.
 Allied Ship Builders, Incorporated, Seattle, \$250,000.
 Sandstrom Ship Building Co., Seattle, \$100,000.
 Sloan Shipyards Co., Olympia, \$1,000,000.
 Ward & Burkheimer Ship Building Co., Seattle, \$100,000.
 West Coast Ship Building Co., Spokane, \$1,000,000.
 Union Ship Building Co., Seattle, \$100,000.
 Todd Dry Dock & Construction Co., Tacoma, \$500,000.

Big Electrical Contract

Contracts totaling approximately \$2,000,000 have been placed recently with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., by the New York Ship Building Co., Camden, N. J., for furnishing the necessary electrical equipment for propelling the new super-dreadnoughts COLORADO and WASHINGTON.

The equipments to be furnished are practically duplicates of that contracted for by the navy department for the battleship TENNESSEE, now building at the New York navy yard. The four propellers, as in the case of TENNESSEE, instead of being mechanically connected to driving engines or turbines, are to

be driven by individual motors. The current for the motors will be furnished by two turbine generators.

In addition to the main generating equipment and propelling motors, the contracts include auxiliaries for the main turbine generators and smaller auxiliary turbine generators for supplying light and power throughout the ships. Electric motors will also be utilized for doing nearly all the work on board from raising the anchor to steering.

Will Build in New York

Furness, Withy & Co., Ltd., the large British shipping firm, have purchased the site at the southwest corner of Whitehall and Pearl streets, New York, and will construct immediately a handsome 6-story, fireproof building as their permanent New York headquarters. The offices at present are located at 32 Broadway. The removal will bring the company more directly into the heart of the shipping district, which, during recent years, has been built up in the vicinity of Battery Park.

The new building will have a front of 79 feet on Whitehall street and 53 feet on Pearl street. The company will be the first British firm to erect a permanent home here. The building is to be called "Furness House".

Furness, Withy & Co. have broadened their activities greatly since the beginning of the war and now rank third among British steamship lines in the amount of tonnage controlled. According to statistics available Jan. 1, 1917, the company controls a fleet of 220 steamers with an aggregate gross tonnage of about 920,000. In addition, there were at that time under construction for the firm and its subsidiary companies 29 vessels of close to 170,000 tons gross.

The only British companies with a larger controlled tonnage are the Peninsular & Oriental Steam Navigation Co., which last year acquired the New Zealand and Federal Shipping companies, and the Ellerman Lines, which purchased control of the Wilson Line. The fleets of both these companies exceed 1,000,000 tons. Furness, Withy & Co. obtained control of the Prince Line last summer, adding about 180,000 tons to their fleet. The firm has been very active during the war in chartering and purchasing tonnage for the British government without remuneration.

Death of George E. Weed

George E. Weed, engineer and ship builder, died recently at New York after a short illness. He was president of the old Morgan Iron Works and for many years was vice president and director of the New York-Cuba Mail Steamship Co., as well as director of the Old Dominion Steamship Co. and

several large banks and trust companies.

Born at Danbury, Conn., Oct. 3, 1839, Mr. Weed was for the greater part of his active business career identified with the old Morgan Iron Works, of which the late John Roach was chief owner. Mr. Weed was for many years treasurer of the concern and after Mr. Roach's death was president. The Morgan Iron Works and its ship yards, the Delaware Iron Ship Building & Engine Works, Chester, Pa., constituted at one time one of the leading ship building concerns in this country. A great many of the finest vessels of the American merchant marine and many vessels for the navy were built by the Morgan Iron Works.

Mr. Weed was one of the charter members of the Society of Naval Architects and Marine Engineers, and for many years was one of the vice presidents of the society. He was one of the trustees of Webb's Academy and Home for Ship Builders, and as chairman of the finance committee, had given long and useful service.

Thos. J. Kehoe Promoted

Thomas J. Kehoe, one of the best known pursers of the Alaskan routes, has been appointed contracting freight agent of the Pacific Steamship Co. by General Freight and Passenger Agent C. E. Flye. He enters immediately on his new duties. Years ago, Mr. Kehoe entered the service of the Pacific Coast Steamship Co., and slightly more than four years ago joined the Pacific Alaska Navigation Co. Since then he has been almost continuously in the southeastern and southwestern Alaska route, where he built up a large circle of friends. He was the purser of the steamship ADMIRAL SAMPSON when she was rammed and sunk in Puget sound in August, 1914. For the last year and a half he has been purser of ADMIRAL WATSON.

George E. Lawrence, Philadelphia representative of the Eckliff Automatic Boiler Circulator Co., Detroit, has been commissioned a first lieutenant in the United States naval reserve and is now in active service somewhere along the Atlantic. Robert Bellows, Fleeton, Va., another eastern agent of the Eckliff company, is also serving in the naval reserve, with commission of warrant machinist. Both of these men are well qualified for the important duties to which they have been assigned.

E. T. Klippert, vice president of the Eckliff Automatic Boiler Circulator Co., Detroit, is making a tour of the Pacific coast states. While on the coast, Mr. Klippert will inspect installations of Eckliff circulators recently completed there, including several in the large tankers now building for the Standard Oil Co., of New Jersey.

April Lake Levels

The United States lake survey reports the stages of the Great Lakes for the month of April, 1917, as follows:

Lakes.	March.	April.
Superior	602.33	602.28
Michigan-Huron	580.46	580.78
St. Clair	574.79	575.21
Erie	571.53	572.57
Ontario	245.17	246.24

Lake Superior is 0.05 foot lower than last month, 0.06 foot lower than a year ago, 0.72 foot above the average stage of April of the last 10 years, 0.41 foot below the high stage of April, 1860, and 1.74 feet above the low stage of April, 1911. During the last 10 years the April level has averaged about the same as the March level and 0.3 foot lower than the May level.

Lakes Michigan-Huron are 0.32 foot higher than last month, 0.88 foot higher than a year ago, 0.63 foot above the average stage of April of the last 10 years, 2.45 feet below the high stage of April, 1886, and 1.56 feet above the low stage of April, 1896. During the last 10 years the April level has averaged 0.2 foot higher than the March level and 0.3 foot lower than the May level.

Lake Erie is 1.04 feet higher than last month, 0.12 foot higher than a year ago, 0.16 foot above the average stage of April of the last 10 years, 1.61 feet below the high stage of April, 1862, and 1.31 feet above the low stage of April, 1895. During the last 10 years the April level has averaged 0.6 foot higher than the March level, and 0.4 foot lower than the May level.

Lake Ontario is 1.07 feet higher than last month, 0.16 foot lower than a year ago, 0.14 foot below the average stage of April of the last 10 years, 2.19 feet below the high stage of April, 1886, and 1.40 feet above the low stage of April, 1872. During the last 10 years the April level has averaged 0.5 foot higher than the March level, and 0.5 foot lower than the May level.

Todd Yard Ready Soon

Conferences have taken place recently between San Francisco capitalists and Gen. James M. Ashton, Tacoma, Wash., a leading director of the new Todd ship yards in that city, on the construction of wooden ships desired by the government in the big ship building program.

"The Tacoma yards of the Todd company will be ready for the actual construction of ships by July or August," said General Ashton. "The principal output of the new yards will be steel

ships, Cunarders and possibly some cruisers. I have been in conference with San Francisco men on the construction of ships that the government seeks in its building program. Before the larger ships are laid down, some smaller boats, useful to the government in its war program, may be constructed. This feature of the work I have talked over with men in San Francisco. Ship building activity is the big thing on Puget Sound just now, new yards cropping up almost daily, and the Todd yard in Tacoma will be an extraordinarily large one."

Iron Foundry Built

The Lunkenheimer Co., Cincinnati, has completed a new iron foundry, which occupies an area of 36,000 square

Soo Canal Report

The long delay in opening the lake navigation season is reflected in the report of the superintendent of the St. Mary's Falls canal, for April. During that month, 258,290 net tons of freight passed through the canal, against 2,215,362 net tons in April, 1916, a decrease of 1,957,072 net tons. The April movements during the past six years are as follows:

	Net Tons.
April, 1916	2,215,362
April, 1915	1,434,735
April, 1914	774,520
April, 1913	1,905,555
April, 1912	166,918
April, 1911	792,587

The American canal carried 230,888 net tons, and the Canadian canal

April Lake Commerce Through Soo Canal

EAST BOUND.

Articles.	U. S. Canal.	Can. Canal.	Total.
Flour, barrels
Wheat, bushels
Grain, bushels
Copper, short tons.....
Iron ore, short tons.....
Pig iron, short tons.....
Lumber, M. ft. B. M.....
Stone, short tons.....
General merchandise, short tons.....	4	.....	4
Passengers, number

WEST BOUND.

Flour, barrels .....	.....	.....	.....
Grain, bushels .....	.....	.....	.....
Coal, hard, short tons.....	82,792	7,500	90,292
Coal, soft, short tons.....	144,818	15,500	160,318
Iron ore, short tons.....	.....	.....	.....
Manufactured iron, short tons.....	.....	.....	.....
Salt, barrels	6,000	.....	6,000
Oil, short tons.....	.....	.....	.....
Stone, short tons.....	.....	.....	.....
General merchandise, short tons.....	2,374	4,402	6,776
Passengers, number .....	.....	.....	.....

SUMMARY

Vessel passages, number.....	130	36	166
Registered tonnage, net.....	455,528	93,609	549,137
Freight:—			
East bound, short tons.....	4	.....	4
West bound, short tons.....	230,884	27,402	258,286
Total freight, short tons.....	230,888	27,402	258,290
U. S. canal opened April 24, and Canadian canal opened April 25, 1917.			

feet. In addition, a pattern storage with 18,000 square feet of floor space has been constructed. Both the pattern storage and foundry buildings are reinforced concrete and provisions have been made for future extensions. A cupola with a capacity of 10 tons per hour has been installed, together with special melting furnaces for the treatment of the various alloys used in making Lunkenheimer products.

Among the engineering appliances manufactured by the Lunkenheimer Co. are valves of all kinds, water columns and gages, whistles, pipe fittings, injectors, lubricating devices, oil pumps, etc.

The Standard Oil steamer EAGLE has been completed at the Union Iron Works. She was launched Feb. 3.

27,402 net tons. Only four tons were carried east bound. The summary for the month is shown in the accompanying table.

The Thames ship yard, New London, Conn., is constructing for the New London Ship & Engine Co., a floating shop, 30 x 130 feet. When completed the float will be towed to Provincetown, Mass., anchored in the harbor, and used as a tender for submarines undergoing trial tests.

M. A. Hanna & Co., Cleveland, have issued the 1917 edition of their list of American lake vessels, arranged according to fleets and carrying capacity. This list includes the boats which will be launched by lake ship yards in 1917.

Will Not Drop Wooden Ship Plans

The press reports that the government's plan to build a great fleet of wooden carriers may be abandoned, are refuted by a statement furnished the Washington correspondent of THE MARINE REVIEW, by Theodore Brent, vice chairman of the United States shipping board. The statement explains that the adoption of the steel ship program will not interfere with the construction of wooden ships. Washington officials in particular and the country at large are rapidly awakening to the imperative need of ships of all kinds, and the war emergency assures a vigorous demand for boats of every class, both steel and wooden.

Advance Wages on Lakes

THE Lake Carriers' Association has adopted a wage scale to be paid on vessels enrolled in the association that represents an average advance of about 20 per cent. The recommendations were made by a sub-committee of the executive committee, after the latter had decided that advances should be made. The detailed schedule follows:

STEEL STEAMERS—FIRST CLASS.

	Per month.
*Class A.	
Chief engineers	\$220.00
First assistant engineers.....	170.00
Second assistant engineers.....	130.00
†Class B.	
Chief engineers	205.00
First assistant engineers.....	150.00
Second assistant engineers.....	130.00
First mates	170.00
Second mates	130.00
Boatswains	85.00
Cooks, vessels over 4,000 gross tons..	120.00
Second cooks	60.00
Waiters	50.00
Porters	47.50
Firemen, oilers and water tenders....	72.00
Wheelmen-lookoutsman	72.00
Ordinary seamen	47.50
Coal passers	45.00

*Class A—Steel steamers of over 4,000 gross tons government register.
†Class B—Steel bulk freight steamers of 2,100 to 4,000 gross tons government register, and steel package freight steamers over 3,000 gross tons, government register.
Boatswains shall be carried on all boats of over 4,500 gross tons, government register.

STEEL STEAMERS—SECOND CLASS.

Chief engineers, bulk freight steamers 500 to 2,100 tons.....	\$185.00
Assistant engineers, bulk freight steamers 500 to 2,100 tons.....	145.00
First mates	145.00
Second mates	120.00
Cooks, vessels less than 4,000 gross tons	105.00
Second cooks	60.00
Waiters	50.00
Porters	47.50
Firemen, oilers and water tenders....	72.00
Wheelmen-lookoutsman	72.00
Ordinary seamen	47.50
Coal passers	45.00

STEEL PACKAGE FREIGHT STEAMERS. Over 1,800 gross tons.

Chief engineers	\$205.00
First assistant engineers.....	150.00
Second assistant engineers, where carried	130.00
First mates	170.00
Second mates	130.00
Cooks, vessels over 4,000 gross tons	120.00
Cooks, vessels under 4,000 gross tons	105.00
Second cooks	60.00
Waiters	50.00
Porters	47.50
Firemen, oilers and water tenders....	72.00
Wheelmen-lookoutsman	72.00
Ordinary seamen	47.50
Coal passers	45.00

WOODEN STEAMERS—FIRST CLASS.

Chief engineers, bulk freight steamers over 1,200 tons. Package freight steamers over 750 tons.....	\$185.00
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Assistant engineers, bulk freight steamers over 1,200 tons. Package freight steamers over 750 tons.....	135.00
First mates	145.00
Second mates	120.00
Cooks	105.00
Second cooks	60.00
Waiters	50.00
Porters	47.50
Firemen, oilers and water tenders....	72.00
Wheelmen-lookoutsman	72.00
Ordinary seamen	47.50
Coal passers	45.00

BARGES.

Mates on barges of the smaller class not less than ten dollars (\$10.00) per month more than seamen on the same vessel; and donkeymen five dollars (\$5.00) per month more than seamen.

Mates' wages on tow barges of the larger class	\$95.00
Able-bodied seamen on tow barges....	72.00
Engineers on tow barges carrying towing machines	95.00
Cooks on tow barges the same wages as the seamen on the same barges.	
Ordinary seamen on barges.....	47.50

GENERAL.

Sailing wages to be paid during fitting out. Sailing wages of seamen, firemen and oilers to be paid until the vessel is laid up. Vessel is considered laid up when steam is turned off.

Wheelmen-lookoutsman are men who stand a three-hour trick at the wheel and three-hours' watch on deck each watch. Unlicensed deck engineer, where carried, same wages as boatswain.

Ore on Dock May 1

Statistics furnished *The Marine Review* by the various dock managers at Lake Erie ports show that the amount of ore on Lake Erie docks May 1 was 4,772,232 gross tons, compared with a balance of 3,343,405 gross tons on May 1, 1916, an increase of 1,428,827 tons.

The total rail shipments from Lake Erie ports to furnaces during the winter season from December, 1916, to May 1,

1917, were 5,395,528 tons, as shown in the following table:

	Tons.
On dock Lake Erie ports, Dec. 1, 1916	10,167,760
On dock May 1, 1917.....	4,772,232
By rail to furnaces, winter of 1915-16	5,395,528

The amount shipped to furnaces during the 1916 navigation season was 44,982,917 tons, which, added to the winter shipments, gives a total of 50,378,445 tons of ore handled to furnaces over these docks in the year ended May 1. This total compares with 40,716,358 tons in the corresponding period ended May 1, 1916; 25,230,489 tons in the year ended May 1, 1915.

The following table shows the ore on dock at the close of the 1916 navigation season, and at the opening of the 1917 season, April receipts being included in the May 1 balance:

	Gross tons.	May 1, 1917.	Dec. 1, 1916.
Port.			
Buffalo	219,691	438,712	
Erie	406,078	625,193	
Conneaut	183,255	1,363,550	
Ashtabula	1,660,818	3,266,572	
Fairport	237,645	474,930	
Cleveland	970,973	1,936,906	
Lorain	503,618	1,076,105	
Huron	333,124	590,743	
Toledo	257,030	394,869	
Totals	4,772,232	10,167,760	

Lake Erie Receipts

Out of a total movement of 211,532 tons in April, 51,988 tons went to Lake Erie ports, distributed as follows:

Port.	Gross tons.
Erie	6,765
Fairport	9,337
Cleveland	35,886
Total	51,988

April Ore Shipments

April ore shipments from upper lake ports were 211,532 tons, compared with 1,658,411 tons in April, 1916, a decrease of 1,446,879 tons. The detailed shipments follow:

Port.	April, 1916.	April, 1917.
Escanaba	398,214	190,407
Marquette	53,258	
Ashland	147,852	
Superior	211,340	21,125
Duluth	538,281	
Two Harbors	309,466	
Totals	1,658,411	211,532
1917 decrease		1,446,879

1917 Great Lakes Red Book Completed

The 1917 edition of THE GREAT LAKES RED BOOK, which has just been printed, reveals further evidence of the tendency toward decreasing the number of fleets operating vessels on the Great Lakes. The number of fleets now operating lake boats is 288, against 308 fleets at the opening of 1916, and 360 at the opening of 1915. The data for the new edition has just been compiled by THE MARINE REVIEW, and the book is now ready for distribution. The decrease in the number of fleets bears little relation to the carrying capacity, as the average holdings of the various fleets are higher.

THE GREAT LAKES RED BOOK contains a practically complete list of more than 1,000 lake vessels, together with the names of the owners, captains and engineers of each individual boat. The main particulars of any vessel is easily found, as the system of indexing adopted some years ago has been preserved. In addition, the book shows the capacities of all ore carriers on the Great Lakes.

Training Boys for Future Officers

Nautical Schools of New York and Massachusetts Are Turning Out Splendidly Trained Graduates—Work Should Be Extended

By E. C. Kreutzberg

ONE of the deplorable results of the lack of interest which for several decades past has characterized the attitude of the United States toward the welfare of its merchant marine, is the absence of adequate facilities for training officers for merchant vessels. One effect of our shortsighted policy in this respect, revealed, since the outbreak of the European war, has been the inability of some American vessel owners to secure the number of officers required by law. Heavy fines were levied upon the steamship companies involved and although these fines later were cancelled, the scarcity of men continued and President Wilson finally found it necessary to suspend the citizenship laws and to permit aliens to command and officer such ships as have been acquired and admitted to registry since the commencement of hostilities abroad. The ship building schedules show that between 100 and 125 private, cargo and passenger vessels, ranging from 3,000 to 10,000 tons, will be launched from American yards during 1916 and 1917. These will require about 800 officers. In addition, a large number of smaller vessels now under construction, as well as the federal-built boats which the shipping board intends to construct, must be provided for. The scarcity of officers, far from being relieved, is steadily becoming more acute. It is no longer possible, in view of the highly specialized knowledge now required in operating modern vessels, to

train men by the haphazard methods of by-gone days. The exacting requirements of today have made it necessary to fit them more thoroughly for their duties and as a result, the modern schoolship is performing an exceedingly important function in training men for the great mercantile marine fleets of the world. Practically every country even pretending to operate a merchant marine leads the United States in this work. When the war broke out, Great Britain was operating 18 school ships, Germany eight, and other countries, including Japan, Belgium, Austria, Brazil, Peru and Argentina, one or more each. In most instances, the vessels used as

schoolships were built especially for the purpose, and were so designed that they can at any time be put into the merchant trade.

In contrast to the manner in which this work is conducted by other maritime nations, the United States has only two ships which are devoted to the training of officers for the merchant marine. These are NEWPORT and RANGER, old gunboats which the navy has furnished for the use of the state nautical schools of New York and Massachusetts. In addition to being of a type which is not the most desirable for schoolship purposes, the capacity of the vessels is entirely inadequate.

Each has accommodations for approximately 100 students, and at least 50 applicants are turned away annually by each of the two schools. The navy department has been petitioned vainly time after time for larger vessels of a more suitable type. In fact, such is the lack of appreciation of the work of these institutions that year before last the state of Pennsylvania discontinued its nautical school, and during the past year one of the two remaining schools narrowly escaped passing out of existence. That was the New York nautical school. In 1916, Governor Whitman of New York submitted to the legislature a report respecting a number of activities which he thought should be discontinued. Evidently forgetting that New York is the greatest maritime state in the union, and ignoring the incalculable advantages



SAIL DRILL ON SCHOOLSHIP RANGER OF THE MASSACHUSETTS NAUTICAL SCHOOL



CADETS AT WORK IN THE SAIL LOFT

she derives from her immense lake and ocean trade, the governor recommended the discontinuance of the nautical school on the ground that the expense of maintaining it, in comparison with the benefits derived therefrom, was unwarranted. A bill embodying the recommendation was prepared, but due to the storm of protest which it evoked from boards of trade, merchants' associations, maritime or-

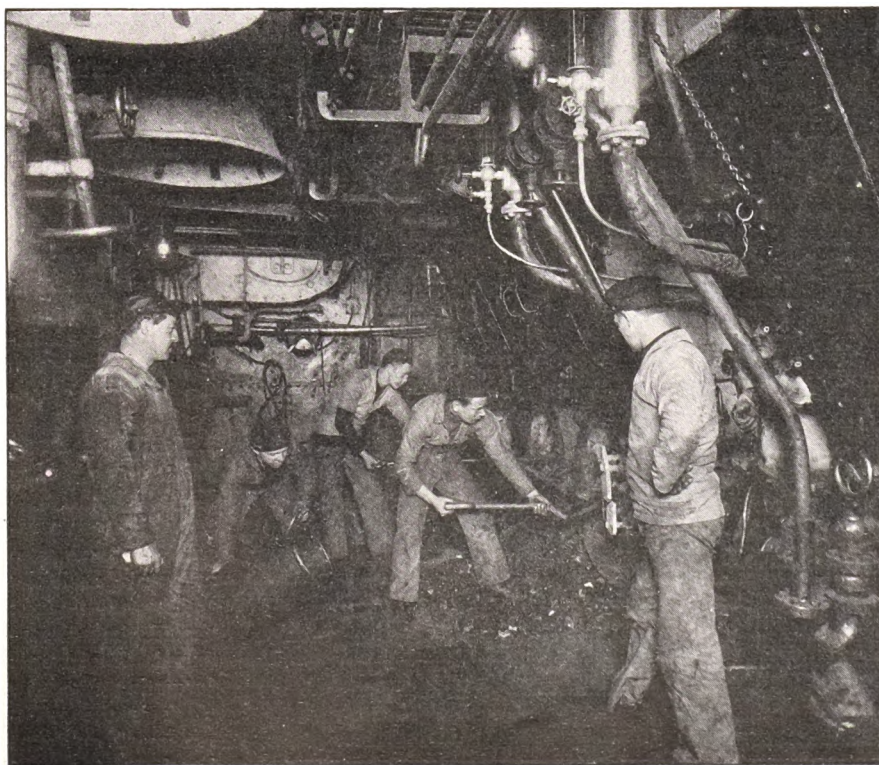
ganizations, taxpayers' leagues and other public-spirited bodies, the bill was killed in committee. Although the annual appropriation for the maintenance of the school was later authorized, the incident undoubtedly exerted an influence which is far from beneficial to the cause of schoolship training.

NEWPORT went to sea Aug. 9, 1916, for the usual practice cruise. She usually departs on these cruises at least two

A School for Officers

The need for officers to command American ships has assumed new importance since the entrance of the United States into the war. The great value of training ships in fitting young Americans as officers is more fully appreciated now, than ever before. The accompanying article outlines in detail the work of the Massachusetts and New York training schoolships, the course which the students must take, and the struggle for existence which these important adjuncts to our merchant marine have been forced to wage.

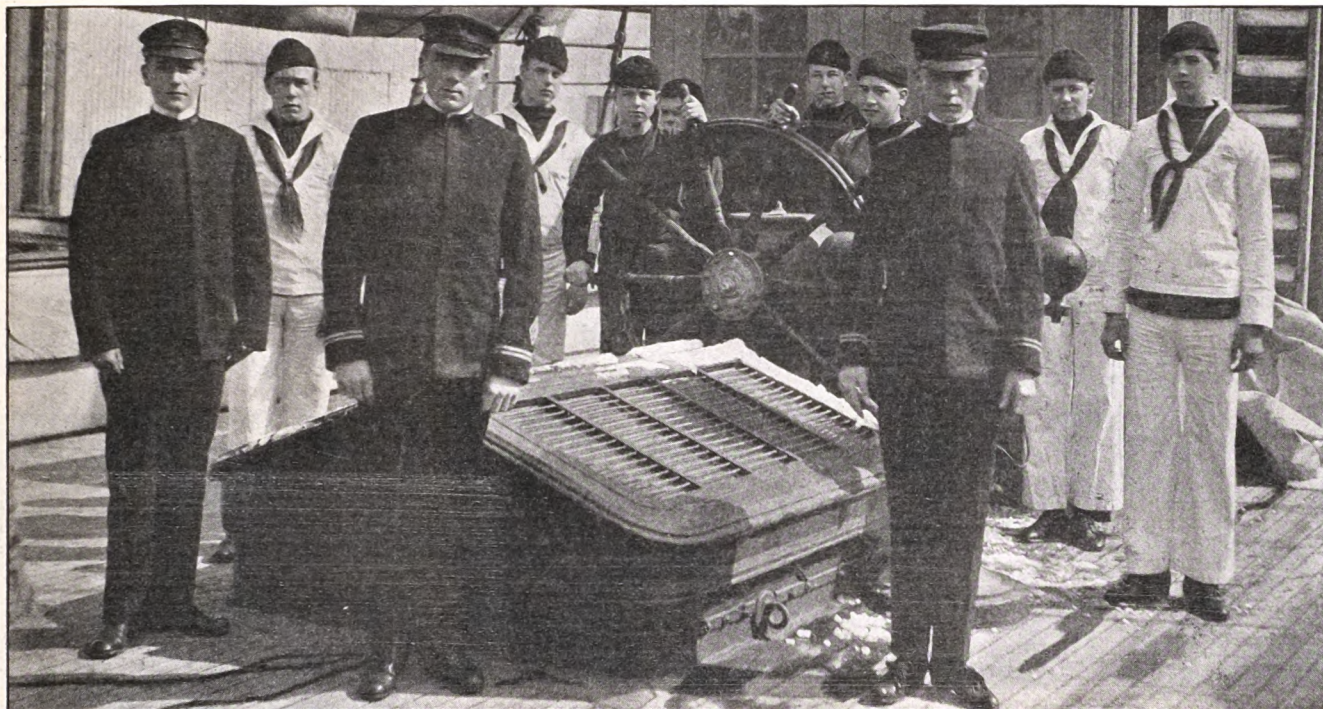
Capt. Emery Rice, commanding MONGOLIA, which sank a German submarine on April 19, is a graduate of the Massachusetts nautical training ship NAUTILUS, being the honor man of the class of 1887. He has been decorated by the Emperor of Japan for "seamanship and humane efficiency" in rescuing five Japanese who were wrecked in a storm. He has served on St. Louis, FINLAND, MINNESOTA and MANCHURIA.



FIRE ROOM INSTRUCTION

months earlier in the year. The delay in getting started was due to the necessity of waiting at the Brooklyn navy yard for about \$20,000 worth of repairs. The cruise of the vessel, accordingly, was confined to a number of Atlantic ports and the Azores.

Aside from a certain amount of prestige which a port acquires through operating a training ship, there are other inducements to conduct such an institution. To secure federal aid, such a school may be maintained either under state or municipal jurisdiction; the New



MERCHANT MARINE OFFICERS OF THE FUTURE

Capt. P. W. Hourigan

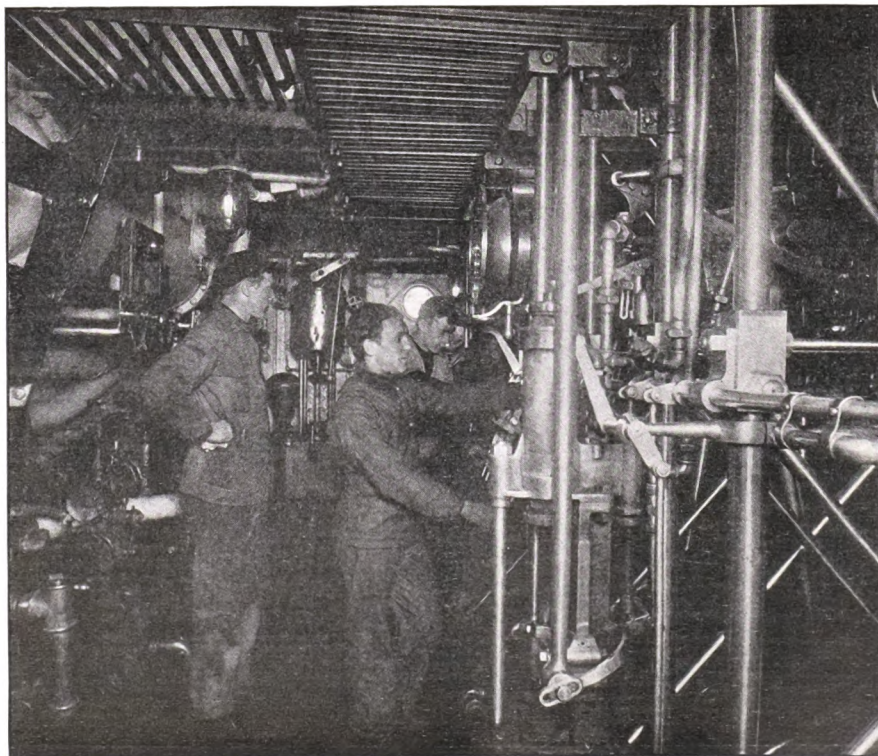
Capt. P. W. Hourigan, U. S. N., superintendent of the Massachusetts nautical school, has had about 35 years' experience in the United States navy. As he served on many of the old time sailing ships, including TRENTON, ENTERPRISE, JAMESTOWN, LANCASTER, ALLIANCE and KEARSARGE, he is especially fitted for conducting the work of the school. During the cruise of the battleship fleet around the world, he served as executive officer of NEW JERSEY. He is the author of a manual on handling vessels under sail, which was adopted by the navy department as a text book at the U. S. naval academy. His last duty before coming to the school was as commandant of the U. S. naval training station at Newport, R. I., where he had charge of 2,000 naval apprentices. He served a tour of duty as instructor in navigation at the U. S. naval academy.

York nautical school, for instance, was established by the board of education of the city of New York in 1876 and was continued by the city until it was taken over by the state of 1913. In 1874 congress passed a law, amended in 1911, which was designed to encourage the establishment and maintenance of school ships at the following ports: Boston, Philadelphia, New York, Seattle, San Francisco, Baltimore, Detroit, Saginaw, Mich., Norfolk, Va., and Corpus Christi, Tex. This act authorized the secretary of the navy to furnish suitable vessels for the use of nautical schools which might be established at these ports. The act, as amended, also authorized the

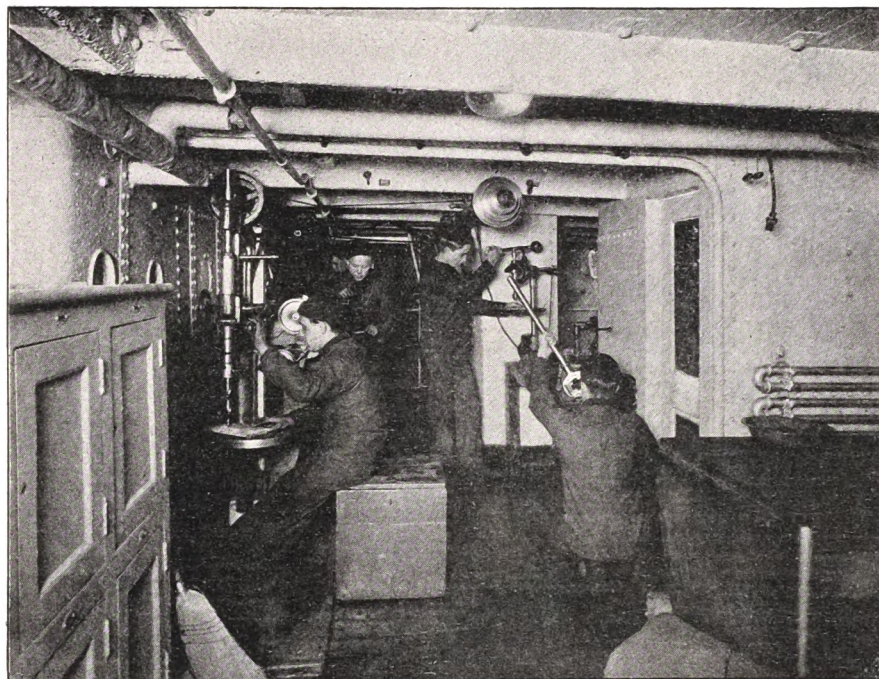
appropriation of amounts up to \$25,000, to be paid annually to each state or municipality maintaining such a school. Although the appropriations had been neglected up to 1916, the last congress, just before its adjournment, took favorable action, with the result that the federal government thus contributes \$250,000 toward the maintenance of NEWPORT and RANGER over the past five years. This is equivalent to about one-third of the actual cost of

the schools to the states of New York and Massachusetts, respectively; for the maintenance of NEWPORT during the current year, the New York legislature recently passed an appropriation of \$73,000. Thus the actual cost of the school to the state is slightly less than \$50,000 annually.

The methods of instilling into the students a thorough knowledge of the science of seamanship are practically the same in both the New York and



CADETS IN THE ENGINE ROOM



CADETS FAMILIARIZING THEMSELVES WITH MACHINE SHOP PRACTICE

Massachusetts schools. The applicants for admission are selected very carefully, and this is particularly true since a large number must be refused owing to the limited capacity of the vessels. The boys must be between the ages of 16 and 20 and must pass a thorough physical examination. They are examined in such subjects as English, history, geography, arithmetic, algebra, grammar, spelling and geometry. The branches of instruction include grammar and composition, keeping ship accounts, geography, mathematics, navigation, physics, seamanship, hygiene and

first aid, engineering and electricity, operation of engines, pumps and boilers, sailmaking, etc. The course of study lasts two years, during which time the boys make their homes on the ships. During the first year, all students are instructed both in practical seamanship and in the engineering functions on board a vessel. At the close of the first year, the classes are divided into seamen and engineer groups, the assignments being governed by the individual preference and aptitude of each student.

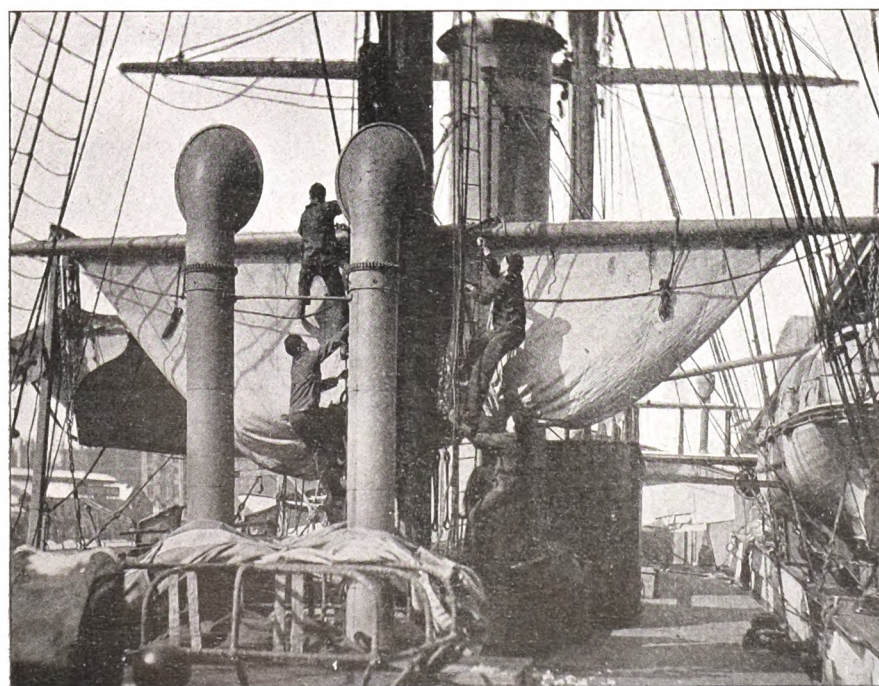
A modified form of naval routine is used on board the vessels. Minor

breaches of discipline are punished by a system of demerits, and only occasionally is it found necessary to dismiss a student. The boys are taught not to fear hard work or physical hardship and as a result they emerge as manly, self-reliant youths who can take care of themselves under any circumstances.

The demand for the products of the two schools at all times is so urgent that every student has an attractive berth awaiting him on graduation. Of 42 graduates from the New York school in 1916, 39 were under pay and at sea



CAPT. F. S. McMURRAY, COMMANDER OF NEWPORT AND SUPERINTENDENT OF NEW YORK STATE NAUTICAL SCHOOL



MONKEY YARD DRILL

within two weeks. The remaining three decided not to go to sea. The value of the training, is reflected in the law that persons other than schoolship graduates cannot apply for an officer's license until they have had three years' experience on ocean or coastwise vessels. As shown by the records, the boys, after graduating, are promoted as rapidly as the law permits. A member of the 1916 class already has become second officer of GARGOYLE, a Standard Oil Co. vessel. A graduate of the class of 1897, Massachusetts state nautical school, was appointed captain of the steamship

Capt. F. S. McMurray

The career of Capt. F. S. McMurray is typical of that of the average successful schoolship graduate. He was born in 1878 and graduated in 1896 from the schoolship *St. Marys*, predecessor to *NEWPORT*. He served before the mast around Cape Horn on his first voyage and then worked his way up from seaman to officer in 28 different merchant ships. He served on the auxiliary cruiser *HARVARD* and participated in the Santiago blockade in 1898. In 1905 Captain McMurray became chief officer of the floating drydock *DEWEY*, taking her to the Philippines. In 1910, he became sailing master of the non-magnetic yacht *CARNEGIE*, which cruised 33,000 miles in a magnetic survey of the oceans. The opening of the European war found him in command of a passenger liner operating between Hong Kong and Philippine ports. He then returned to New York and assumed command of *NEWPORT*.

CHINA at the age of 33 and at the age of 35 was given command of *MONGOLIA*, the second largest vessel flying the American flag. A member of the class of 1901 was appointed captain of *HERMAN FRASCH* at the age of 29. A member of the class of 1902 was appointed a captain in the Merchant & Miners Transportation Co.'s fleet at the age of 28. A member of the class of 1903 was appointed captain of *PANAMAN*, of the American-Hawaiian line, at the age of 30. One of the graduates of the New York state nautical school is Capt. Reginald Fay, superintendent of the marine department of the New York Central railroad. Another graduate is



READING FROM LEFT TO RIGHT: THOMAS W. SHERIDAN, SENIOR INSTRUCTOR; F. R. NICHOLS, JUNIOR INSTRUCTOR; C. E. LITTLEFIELD, EXECUTIVE OFFICER; CAPT. F. S. McMURRAY; CLARENCE J. D'ALTON, SURGEON INSTRUCTOR; C. H. MATTHEWS, U. S. N. RETIRED, CHIEF ENGINEER

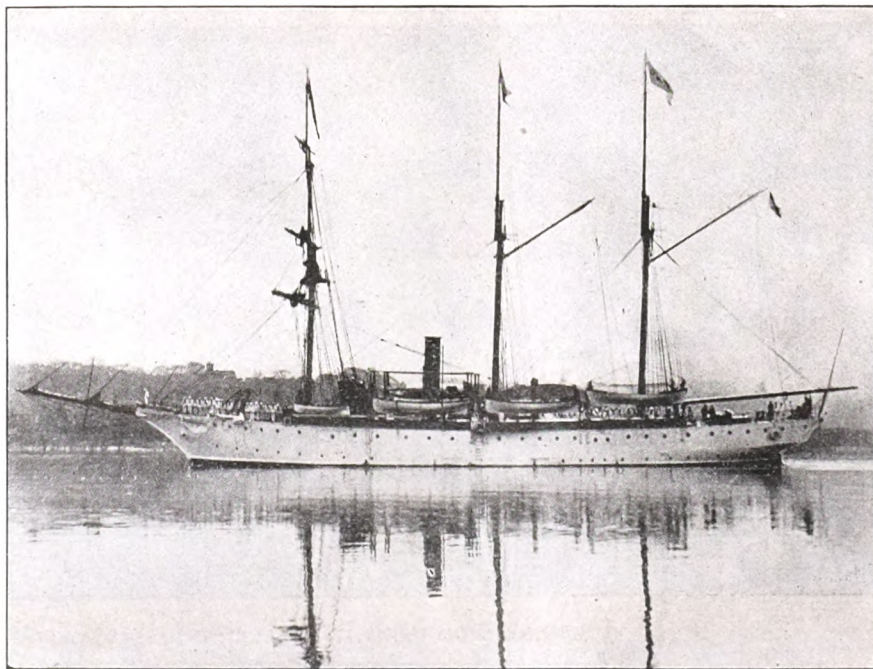
Capt. F. S. McMurray, commander of *NEWPORT*.

The present shortage of American officers is a vital handicap. Without American officers and crews, American vessel owners never can hope to hold a dominating position in the ocean shipping trade of the world. Alien commanders under no circumstances could be expected to be instrumental in developing our foreign trade. Furthermore, aliens naturally could not be depended upon in time of war to divert merchant vessels to the defense of the

country. The need for ample facilities for training American boys to be officers, therefore, is not speculative, but is real and imperative. It may be filled partly by providing the New York and Massachusetts schools with vessels capable of housing at least twice as many boys as now go to sea in *NEWPORT* and *RANGER*. Until a more general interest brings about the establishment of additional nautical schools at various ports in this country, however, a complete solution of the problem is not to be expected.

Larger Ships Needed

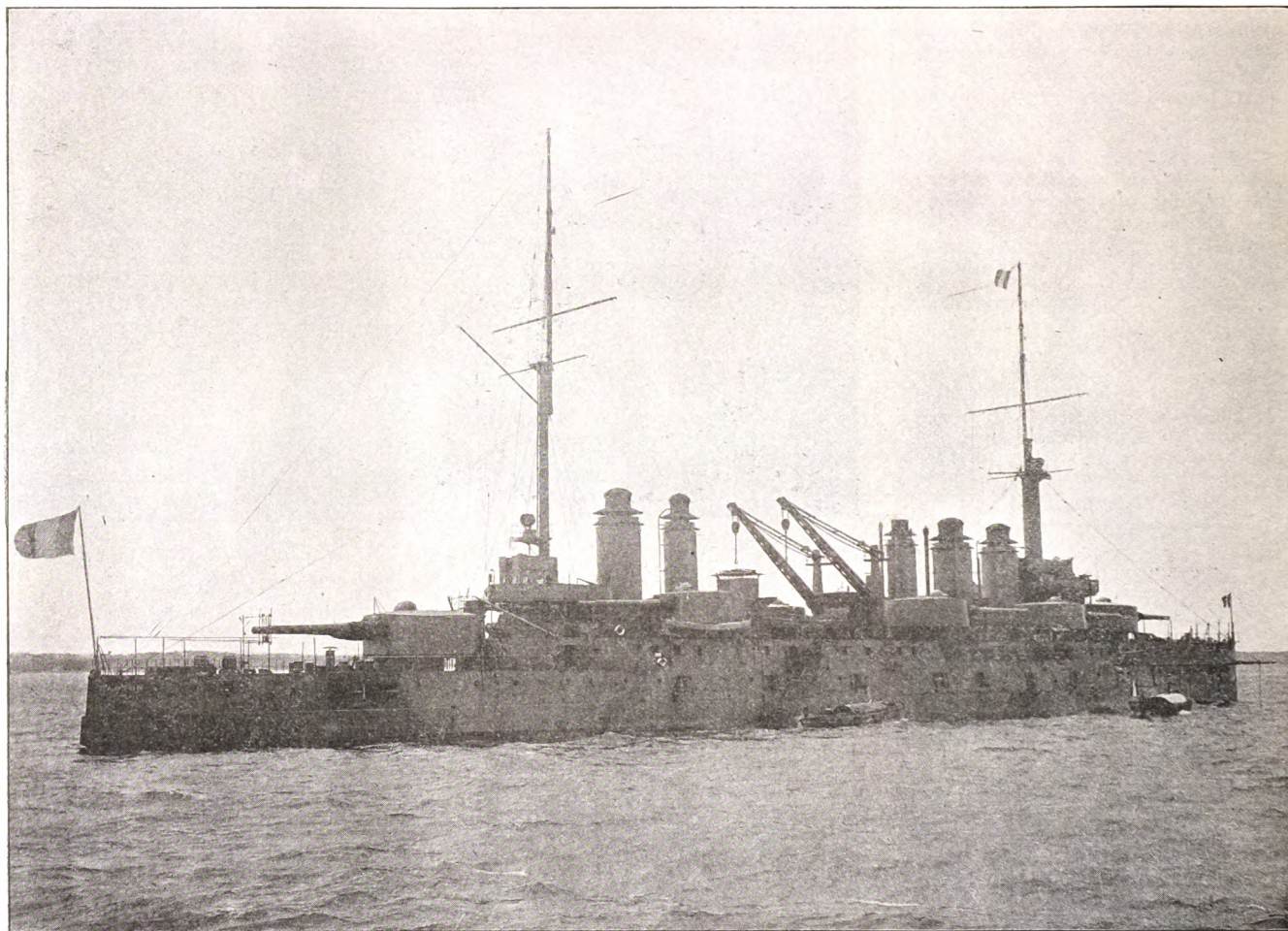
RANGER and *NEWPORT*, now used as training ships by the Massachusetts and New York nautical schools, are old gunboats loaned by the navy department. Both are barkentine-rigged steamers. *RANGER* displaces 1,261 tons, is built of steel and has the following dimensions: Length, 177 feet; beam, 32 feet; draft, 13 feet. *NEWPORT* displaces 1,010 tons, is of composite construction and has the following dimensions: Length, 168 feet; beam, 36 feet; draft, 12 feet. Both vessels are equipped with steam capstan, steam steering gear, submarine signal receiving apparatus, and a complete electrical outfit, including a wireless telegraph set. Each vessel has capacity for quartering 100 cadets, and graduates 40 to 45 annually. At least 50 applicants for the two-year course are turned away from each vessel annually. Thus the schools could advantageously use vessels having just double the capacity of *NEWPORT* and *RANGER*.



TRAINING SHIP *NEWPORT* OF THE NEW YORK STATE NAUTICAL SCHOOL

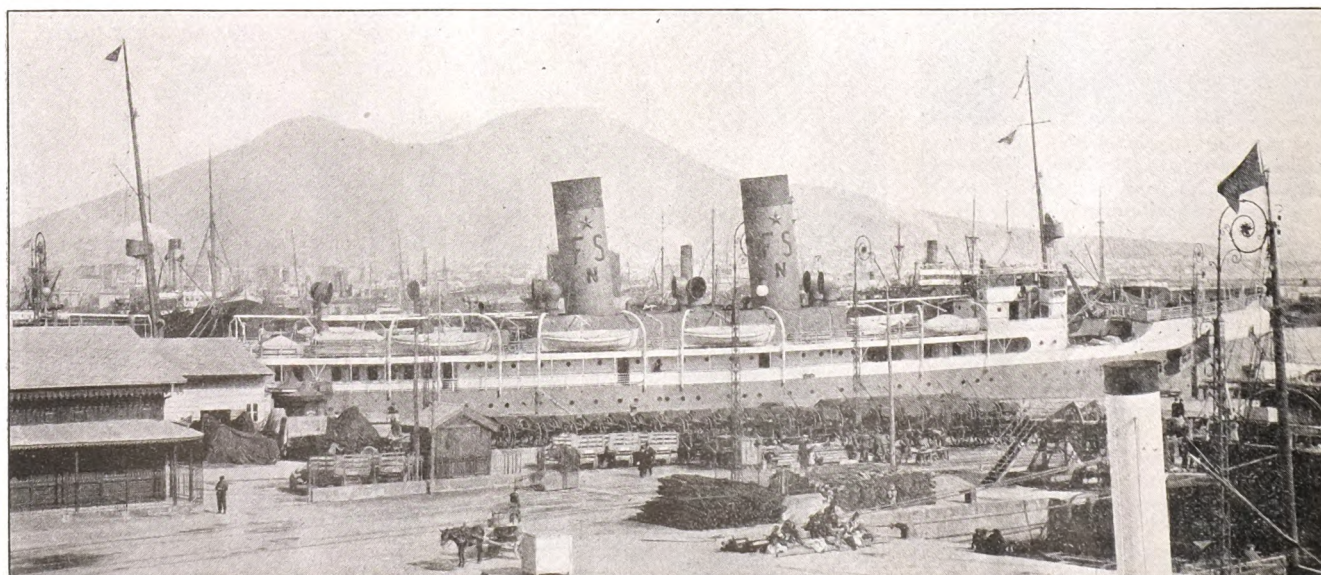
Latest Marine News in Pictures

Payment Will Be Made For Acceptable Photographs



DANTON, FRENCH BATTLESHIP OF THE DREADNOUGHT CLASS SUNK IN THE MEDITERRANEAN

On March 23 the French ministry of marine announced the loss of DANTON with 296 men, the escorting destroyer MASSUE saving 806 of the crew. The vessel was struck by two torpedoes and sank in 30 minutes. DANTON was the first ship of the dreadnought class to be built by our ally. The keel was laid in 1908 and the battleship completed in 1911, being commissioned late in that year. She carried four 12-inch and twelve 9.4-inch rifles as her main and secondary armament.

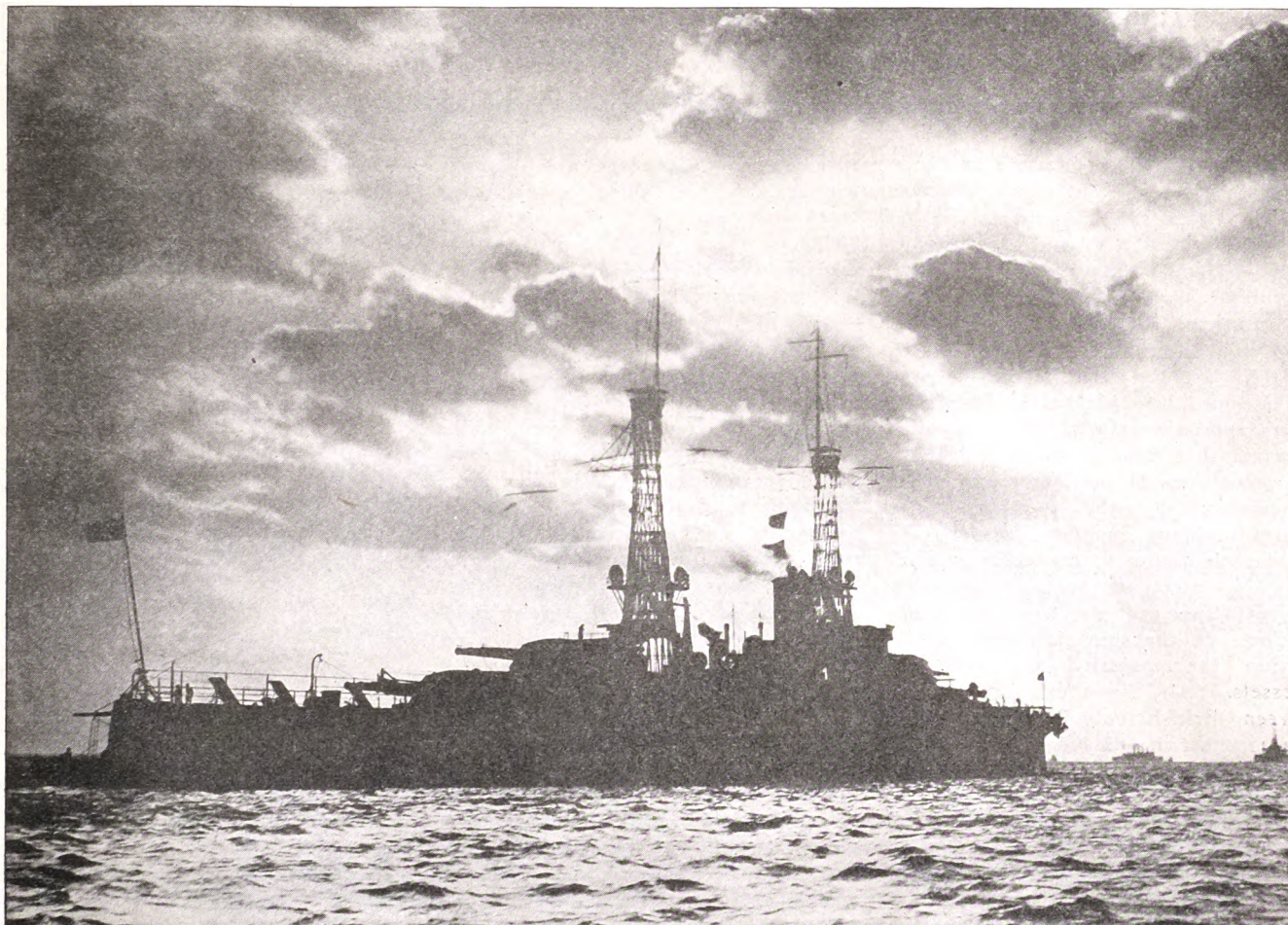


CANNON FOR USE IN THE ALPINE PASSES ABOVE THE CLOUDS

An Italian freighter with a cargo of portable field guns for our allies is shown docked in Naples. Hundreds of small-caliber pieces may be seen. These guns after reaching the foothills are dismounted and packed in slings on the backs of mules and carried to the high peaks in the Alps. Vicious fighting is continuously taking place in the snow swept crags of the Italian and Austrian frontier, the mastery of the passes being essential to both armies. Mt. Vesuvius is shown in the background.

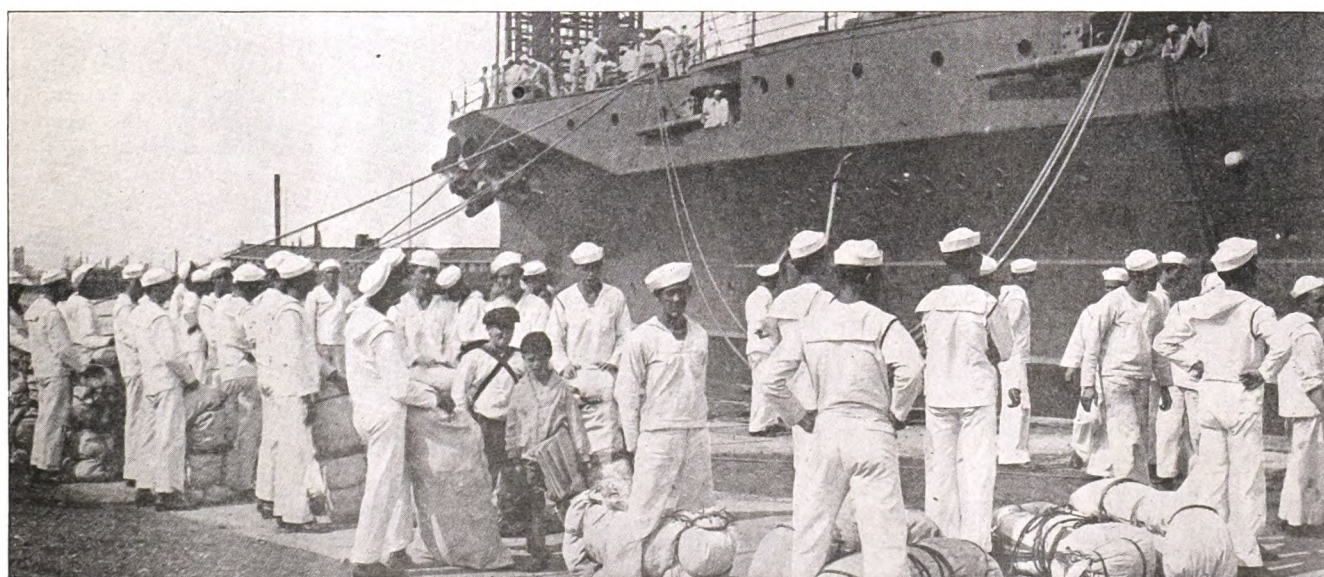
Photographs From Far and Near

Contributions For These Pages Are Solicited



U. S. S. PENNSYLVANIA, THE MOST POWERFUL FIGHTING UNIT IN THE UNITED STATES NAVY

When PENNSYLVANIA made her famous trials off Rockland, Me., Feb. 25, 1916, naval experts were firm in their belief that Uncle Sam's most powerful superdreadnought represented the peak of American ship building skill. With an overall length of 608 feet and a beam of 97 feet, this huge fighter is capable of making 21 knots. She is armed with twelve 14-inch rifles, twenty-two 5-inch rapid fire guns and four 21-inch torpedo tubes. The faith of her builder, commander and crew may soon be tested in the North sea.



THEY HAVE ANSWERED THE CALL OF THEIR COUNTRY, "TO ARMS!"

When Congress passed the act authorizing an increase in the personnel of the United States navy to 87,000 men, it depended on men such as these shown above to respond to their country's call. Enlistments throughout the United States have justified every confidence the American people place in their navy. "When the time comes, and they need us, we'll be there." Here is a draft of recruits with their duffel bags, ready to board a battleship.

Marine News of the War

Interesting Sidelights on the World War Gathered During the Past Month
and Condensed for the Busy Reader

THE shipping problem has been dealt with by Lord Eustace Percy since his arrival in the United States with the British war commission. Shipping, he declared, dominates all trade and therefore it is at the root of all our troubles. He pointed out that at the end of March last the British tonnage was divided up into various services, and that approximately 22 per cent of it was at that time withdrawn for military service, 34 per cent was under requisition by the government to carry military supplies, 32 per cent under obligation to the allies of England in carrying supplies and only about 22 per cent was free from requisition. Of the ships free from requisition the majority are passenger vessels. All the foreign trade between British colonies and foreign ports must be included in the free tonnage, and at present there are only about 200 of these vessels used in this trade. The British empire alone could be made "very comfortable" with the British tonnage now available, but it is recognized that there are outside obligations on this tonnage.

Lord Percy declared that approximately 15 per cent of the British tonnage is in the direct service of the French nation, among which he counted about 200 British vessels now carrying oats, wheat and steel from the United States to France. This direct service is supplemented by the indirect service in which the British tonnage is being used for the account of the allies.

In view of the enormous number of ships which are being sunk, the situation becomes very grave. The balancing factor will be the tonnage which the United States can supply.

England, he said, is at present standardizing the construction of merchant tonnage. She is fabricating and assembling the steel parts, and inasmuch as they are standardized this makes speedy work possible. The American yards are probably not turning out ships as fast as are the British yards, although the detailed statistics on this point are being withheld by both the British and United States officials. Lord Percy said that both the British and American yards must do considerable

speeding up. Even then he doubted whether all the allies' yards combined can turn out merchant tonnage as fast as the German submarines are sinking ships.

When the war is ended, he said, there will be an enormous shortage in the world's tonnage. At present there is a race between the German submarines and the construction work on merchant tonnage in the yards of the allies. The French and Italian yards are doing the best they can, but their tonnage is looked upon as negligible. The ultimate salvation rests with American and British ship building. Japan is building some ships, but Japan is dependent largely upon the United States for her supply of steel.

Lord Percy made it clear that each ally controls its own national tonnage under the pooling agreement entered into by them. The British tonnage, being by far the largest, it is used to supplement the tonnage of the other allies. British ships are, therefore, licensed for each voyage and in this way their service is directed by the government. All the allies, however, are centralized in London and their shipping needs pooled there. They have organized what is known as the inter-allies' chartering executive, which has the duty of chartering all neutral shipping available and allots such tonnage to each of the individual allies according to the urgency of their needs.

The United States steamboat inspection service, in a circular letter dated April 18, 1917, addressed to inspectors of the service in districts affected by the seamen's act, directed that, under instructions from the President given to the secretary of commerce on April 17, 1917, they will not issue, until further advised, certificates of service as able seaman to persons who are enemy aliens.

A bill has been introduced in congress to extend the powers of the government's war risk insurance bureau. The bill has been referred to the house committee on interstate and foreign commerce and is unani-

mously recommended by the advisory board of the bureau, consisting of Hendon Chubb, William N. Davey and William R. Hedge. It has also the active support of William C. Delancy, director of the bureau. The bill in question provides for the reciprocal reinsurance of cargoes and merchantmen by the United States and the other allied powers.

Further survey of the seized German and Austrian ships shows that 71 will be ready for sea within five months. Only the discovery of concealed damages will delay the work beyond that time given. The smaller vessels will be ready for sea in less than four months. Only the great liners like VATERLAND and AMERIKA will require more time. The steamers CLARA MENNIG and PORTONIA have already been commissioned, the former to the Italian and the latter to the French government for one voyage.

Plans to withdraw gradually from the coastwise and West Indies trade such steam vessels as are suitable for the trans-atlantic trade are now being perfected by the United States shipping board. The sub-committee of the council of national defense on shipping has submitted to the board a list of those vessels now in the coastwise and West Indies trade which are willing to go into the Atlantic business. The board has determined to make a survey of the business which is now dependent upon these vessels before permitting them to be diverted. A means of taking care of the coastwise and West Indies business interests by substituting sailing vessels has been under discussion, it is understood. There are a number of sailing vessels now in the Atlantic trade which might more economically be placed in the coastwise trade, because sailing vessels have little means of defense against submarines.

The shipping question has been regulated largely by Great Britain for the allied governments, because the greater part of the tonnage of the world is transported in British bottoms. It is understood at Washington that the United States shall go

into this pooling arrangement and hereafter the merchant tonnage of the United States available for trade will be directed by the pooling committee. For the present this applies only to such vessels as are under the complete control of the United States shipping board. It is proposed to have congress enact an amendment to the shipping law, giving the board authority to direct the routing of any ship which has American registry. This would throw the complete American registered tonnage under the direction of the Inter-Allies' chartering executive.

* * *

John Hodge, important labor leader and a member of the British cabinet, has issued a message to the American workingman. He says:

"You can help win the war; so do it. Don't think that because you cannot send troops at once you can't do anything at once; you can do much. You all can work, capital and labor alike. Build ships. You can teach the world new records in the war job as you have in everything you have undertaken, so do it.

"When I send this message I speak for the British workingmen as a whole, not for any small division. For all those millions I say to their brother and sister workers of America that the fight which we are waging in the workshops and ship yards while our fellows, including our loved sons and blood brothers, are fighting in the field, is as much a fight for American workmen and workwomen as for these allied nations of Europe. It is a fight also for the German workers for it is a fight for the rights of mankind as a whole.

"The American worker is as vital to the fight for human freedom as the

Let Our Washington Office Serve You

Washington today is the center of the nation's activity, both political and industrial. In this mad rush of preparation our Capital city is the mecca toward which all eyes are turned. Marine men unaccustomed to dealing with the government, who figure on ship building and other work, are being called upon to submit their propositions in person. For many years, the Penton Publishing Co., publisher of *The Marine Review*, has had an office in Washington in charge of L. W. Moffett, one of its associate editors. This office is at the disposal of every marine man in America as his headquarters while in Washington. Mr. Moffett will extend you every courtesy and will aid you on your mission. Any communications addressed to him will receive immediate attention. The office is located at 708 Metropolitan Bank building, in the heart of the business district. Incidentally, this is the only office in Washington separately maintained by a publisher of trade and technical papers and in charge of an associate editor to whom has been extended the courtesies of the Press Galleries of the senate and the house.

British or French soldier. On the rapid work of American workers in shipyards, sail lofts, engine works, coal mines, may depend the fate of thousands on this side, and in some part the measure of liberty that humanity is to achieve as a result of vast sacrifice in this war.

"The war is not only in the hands of the fighting men, but very vitally in the hands of the workingmen, for science and military genius of the world have been partially baffled by the submarine. Germany can be whipped and human liberty quickly can triumph if the only weapon she has left is vanquished. Labor can do that, and the labor which can do it is the American labor, for you my fellow-workers in the United States, are not overwhelmed as we workers in Great Britain, France, Russia, Italy and the other allied nations by other and vitally essential war work. There-

fore, I say very earnestly and very solemnly as spokesman of the working people of Great Britain (and I unhesitatingly assume to speak also for the working people of Canada, Australia, New Zealand, even France, Russia, Italy and those of ravaged Belgium) that the fraternal thing which you can do for liberty is to build ships. That is your duty as patriotic Americans, as citizens of the world, as brethren of whatever brotherhood you espouse; your duty and your privilege as advocates of the rights of man. Further ship building means ship equipment; therefore my plea extends beyond the ship yards to the engine works which supply the machinery, to the sailmakers who supply the cordage, to the coal miners who supply the coal; indeed, every working man and woman in America can help your wonderful nation speed up its unparalleled productive energy."

* * *

Dr. Helfferich, one of Germany's many official spokesmen, says: "The wooden ships which the United States intends to build to save Great Britain will, in all probability, only come into use when they have nothing more to save."

* * *

By unanimous vote on April 30, the senate passed a resolution providing for transfer to the American government of title and possession of enemy ships in American ports and their use in commerce under direction of the shipping board.

* * *

Seventy-five Norwegian vessels were sunk by German submarines in April and more than 100 sailors lost their lives. If such a monthly loss were maintained Norway's merchant navy would be destroyed in 18 months.

The Utility of Marine Varnishes

By H. W. Wack

THE owner and master of every vessel, be she commercial bottom or pleasure craft, is vitally interested in paint and varnish as an insurance against the elements which depreciate marine property. Painted and varnished surfaces are assets, while those uncovered are at once a liability and a menace. There is no trade, no form of traffic, no industry wherein paint and varnish are so vital to the upkeep, the sanitation and attractive aspect of structures and equipment, as in shipping.

The destructive action of salt air and sea water upon all exposed wood

and metals is well known and fairly understood by experienced ship and boat men everywhere. But the new owner is not always duly impressed with the part paint and varnish should play in his nautical economy. He is sometimes inclined to let things slide aboard ship until the life and stability of his craft have been undermined. Obviously there is nothing more important to owners and masters of all marine property than to keep that thin filament of paint or varnish between what they possess and what the elements of the sea constantly seek to destroy. Such a policy spells

utility, preservation, cleanliness and beauty.

But while owners and masters may be counted by the thousand, those who avail themselves of the service of vessels, number millions. The passenger's viewpoint concerning paint and varnish is the viewpoint of the buyer of marine service; the traveler and shipper, the patron of the owner and master. It is the passenger and his attitude that create what we may term those subtle forces which make one ship and its service popular, another an object of distrust, disgust and avoidance. The traveling public

is lured to the decks of enterprising masters by white enamel, paint and varnish, and the wholesome conditions these beautifying preservatives create. And it is right there that the sagacity of the owner of vessels should exercise eternal vigilance and see to it that every item of marine property over which his command prevails, shall be kept in its highest state of beauty and utility by paint and varnish.

Finally the continuing stability and sound condition of wood and metal marine equipment depend almost entirely upon paint and varnish skilfully and promptly applied whenever necessary. This of itself is insurance against the insidiously destructive operation of the elements and a signal to passenger traffic that all is well aboard craft so attentively ship-shaped.

Of the nature and technical uses of pigments and varnishes much of interest to marine men might be written. There is a considerable trade literature upon the subject. The least known and perhaps most interesting of the group are the facts concerning the large number (200 or more) specific varnishes manufactured for special uses. We hear of an all-around varnish, that is, a varnish for every purpose; but varnish makers frankly state that there is no such product in its perfection and, in the nature of things, cannot be. There are, however, very serviceable universal varnishes which approximate the good qualities of many. The varieties of varnish must necessarily be as numerous as the arts and industries in which they are applied. These varieties are again subdivided into a long line of special qualities for differing specific purposes. The varnish on a gun barrel or the works of a Swiss watch are as different from the varnish on the outside of a Pullman car or a transatlantic steamship, as champagne differs from port wine.

What Varnish Is

Varnish is a solution or fluid made from various fossil gums, oils and volatile driers, subjected to specific degrees of heat, an elaborate filtering process, and, in the case of the finer varnishes, ripened for periods from six to 18 months, in sealed tanks in which an even temperature is maintained. For lack of adequate manufacturing facilities, capital and skill, many raw and crudely made varnishes reach the market and by their impermanence and a score of other defects, often discourage the use of varnish where a properly made and matured quality varnish is greatly needed. But long established varnish makers, whose products are proverbially reliable, do

not distribute varnishes of that description.

Varnish dries by the evaporation of its volatile constituents, by the oxidation of other constituents or partly by evaporation and by oxidation. The purpose of varnish, generally stated, is to enhance the beauty of surfaces, to protect them from injury, to increase the luster or hardness of other coatings (paint, etc.); and technically speaking, to exclude moisture and gases, vapors and other atmospheric agencies of decomposition and decay, to prevent corrosion and to reduce friction.

Varnishes Classified

Broadly speaking, varnishes are classified as oil varnishes, spirit varnishes, japans and enamels, and specialties, like the varnishes and driers used in paint manufacture.

Marine varnishes are especially made to protect ship surfaces from salt or fresh water and marine atmosphere. Many years ago a long-oil, tough, elastic varnish was made for the spars of ships. It became known as "spar varnish" and similarly made exterior varnishes are now often referred to as spar varnish. Many persons, ignorant of the origin of the term, have erroneously assumed that "spar" referred to a varnish ingredient. Practically all varnishes made with a maximum amount of oil, to toughen and render them elastic and to a degree water resisting, are generally designated as spar varnish. There are, however, many transparent exterior varnishes, which are in fact identical in content and method of manufacture with the so-called spar varnishes. Wherever a tough, elastic, weather and water resistant varnish is required, the transparent exterior varnishes are highly serviceable.

Of the degrees of luster in the numerous varnishes indicated, that is a matter of easy attainment by rubbing or not rubbing the varnished surface after it is dry. Many varnishes are especially made to produce any degree of gloss desired from a glitter to an almost invisible dull polish.

The romance of varnish is another story. What we know of Egyptian mummies suggests its interest to the student of ancient lores. What has preserved the bodies of the kings of Egypt for thousands of years is indeed a substance which should interest every ship and boat owner in the world, especially when varnish in addition to preserving his property adds the elements of beauty and sanitation to marine structures and equipment.

Reorganize Engine Firm

The August Mietz Corporation is the title of a company recently organized to take over the business of August Mietz with a plant at 128-138 Mott street, New York. There will be no change in the nature of business, which for the past 30 years has been the manufacture of oil engines both for stationary and marine installations. Several of the company's engines have been installed by the government for auxiliary marine purposes, such as driving air compressors, wireless generators, etc. A large number of the air compressor sets have been installed on government light ships. The company is now building a large plant in New York City for manufacturing large size units, and will have one of the most modern and up-to-date engine manufacturing assembling and testing plants in the country. The officers of the new corporation are: Emma C. Rueff, president; Emil Rueff, vice president and treasurer; Otto V. Schrenk, secretary, and Louis C. Eitzen, general manager.

Equipment for Navy

Circulators made by the Eckloff Automatic Boiler Circulator Co., Detroit, are well represented in ships of the United States government now under war orders. Several of the larger Scotch-boilered ships of the United States navy and the war department are thus equipped, as well as boats of the United States coast guard service; United States lighthouse service; United States coast and geodetic survey, and bureau of immigration. In addition, these circulators have been installed in the boilers of a large number of freighters, steam yachts, fishing steamers and other craft taken over by the United States for government service during the war.

Takes Over Business

The Marine Decking & Supply Co., Philadelphia, has purchased the business of the Litosilo Co. of America. The Marine company will not only manufacture the decking formerly made by the Litosilo company, but will handle paneling, tile, ceramic and quarry tile, and other specialties in the marine field.

Captain Fryatt Memorial

Subscription to the Capt. Charles Fryatt memorial fund are being solicited by the Imperial Merchant Service Guild. The money is to be used for "the erection of a public memorial and the creation of a fund for the benefit of distressed merchant captains and officers, or their dependents — caused primarily through the war." Contributions may be paid to Capt. George S. Laing, 20 Gibson avenue, Toronto, Ont.

Shipbuilding is Revived in South

The Demand for Tonnage Has Encouraged Southerners to Develop a Shipbuilding Industry That is Surprising the Rest of the Country by Its Rapid Growth

By H. H. Dunn

THE south is rapidly becoming a ship building center. The wider recognition of the importance of ships in successfully prosecuting the war with Germany is being met in the south by expanding some of the existing yards and by building new ones. Its excellent lumber supply places the south in a peculiarly advantageous position to play an important part in supplying the wooden ships which the government wants built in such large numbers. The south has been alive to the need of such ships and for some months past has been preparing to build more of them. At the opening of this year, the south Atlantic and gulf coast yards were building 35 vessels and this number has been increasing steadily.

Yard at Slidell

Among the companies taking part actively in this revival is the Slidell Drydock & Ship Building Co., Slidell, La. Its yard is located just across Lake Pontchartrain from New Orleans. The company has completed three 2,000-ton steamers and has started work on eight other vessels of

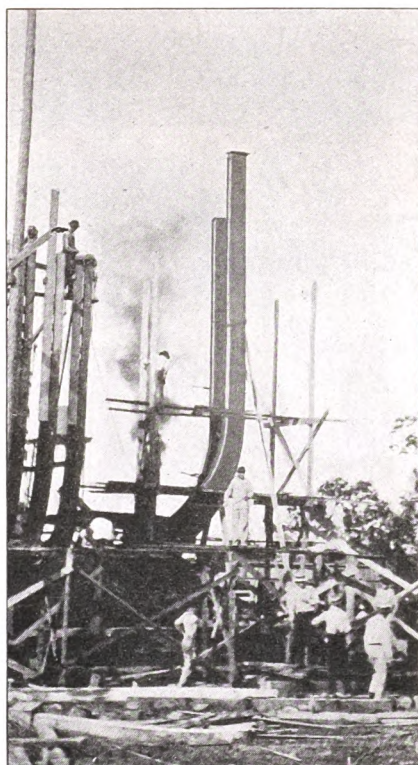
the same size. Contracts have been signed for several slightly smaller steamers, for two big auxiliary schooners and for a river steamer. The Carter Packet Co., for which the Slidell company recently built the river steamer CLIPPER, also ordered another steamer, of similar design, size

and cost, which was delivered this spring. She is named FRITZ SALMEN, after one of the officials of the ship building firm, and will engage in the Mississippi river service.

Purchases Large Slips

The huge Chalmette slips, at New Orleans, which enclose a basin 700 x 1,600 feet, with an average depth of 50 feet, have been sold by the Southern railroad to J. W. Thompson, St. Louis. Work has been begun on the construction of a ship building yard which will accommodate one vessel of the size of a battleship and three smaller craft. The Chalmette slips were built when New Orleans hoped to obtain great traffic from the Panama canal. They cost about \$4,000,000, and something around this figure must have been paid for them by Mr. Thompson.

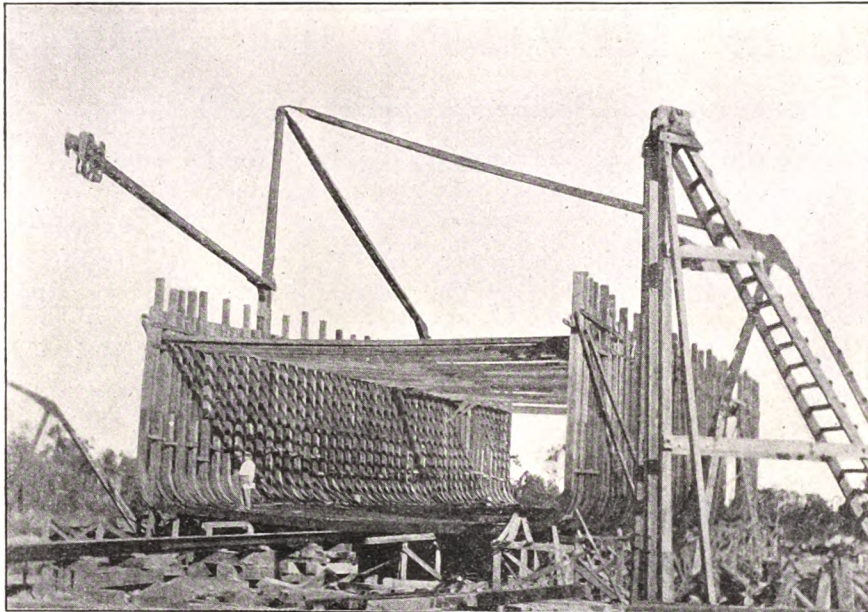
Approximately \$10,000,000 more is to be expended in equipping the yard, bringing the total cost up to nearly \$15,000,000, according to an announcement by the purchasers. The big basin, which opens into the Mississippi river, will be closed by lock gates, thus maintaining any depth of water desired, regardless of the rise or fall of the



STERNPOST CARVED FROM ONE PIECE OF LOUISIANA OAK



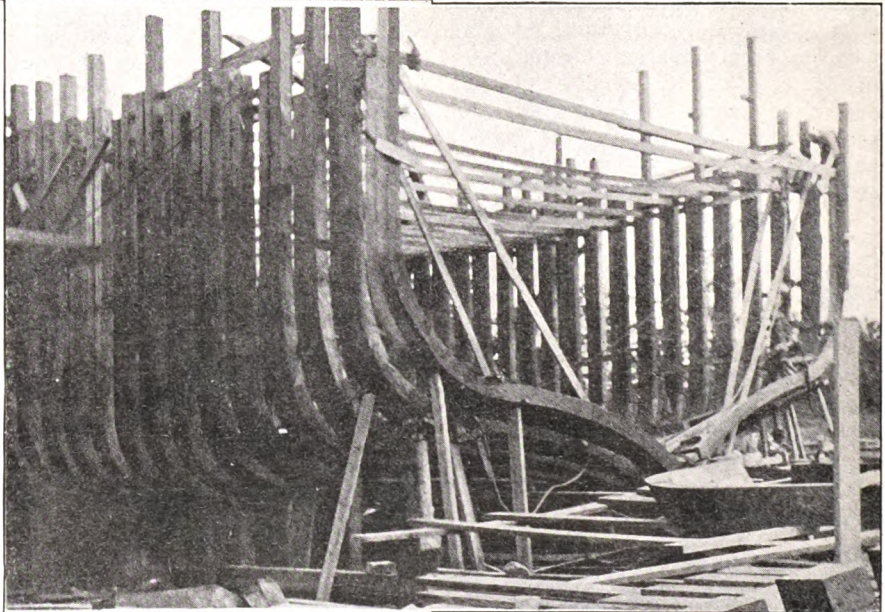
THIS IS RAPIDLY BECOMING A FAMILIAR SCENE IN THE SOUTH



FRAME OF BALTIC NO. 2 ON WAYS
AT SLIDELL

river. This fluctuation in the water level of the Mississippi has been an obstacle to the erection of yards for large ships in New Orleans, but government engineers who have inspected the Chalmette slips have reported that the lock gates will overcome this difficulty.

The big warehouses along both of the longer sides of the slip are served by the Southern railroad, while the Public Belt railroad, which also enters the grounds, gives direct connection with every other railroad terminal and yard in New Orleans and with all of the harbor-front warehouses owned by the city. The slips now have accommodations for berthing eight ships, each

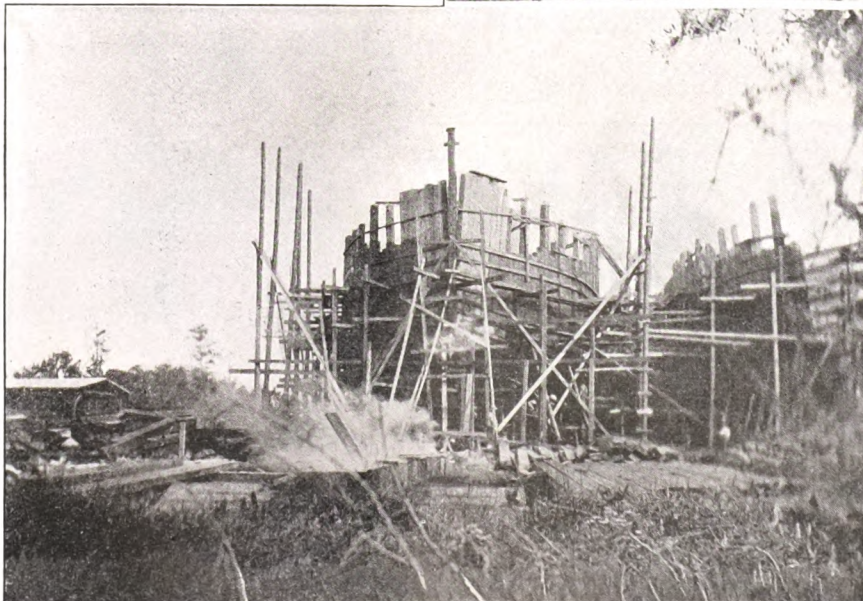


STERN CONSTRUCTION OF BALTIC
NO. 1

other vessels from the marine "junk heap", and will put them into active service soon.

What Was Done in Year

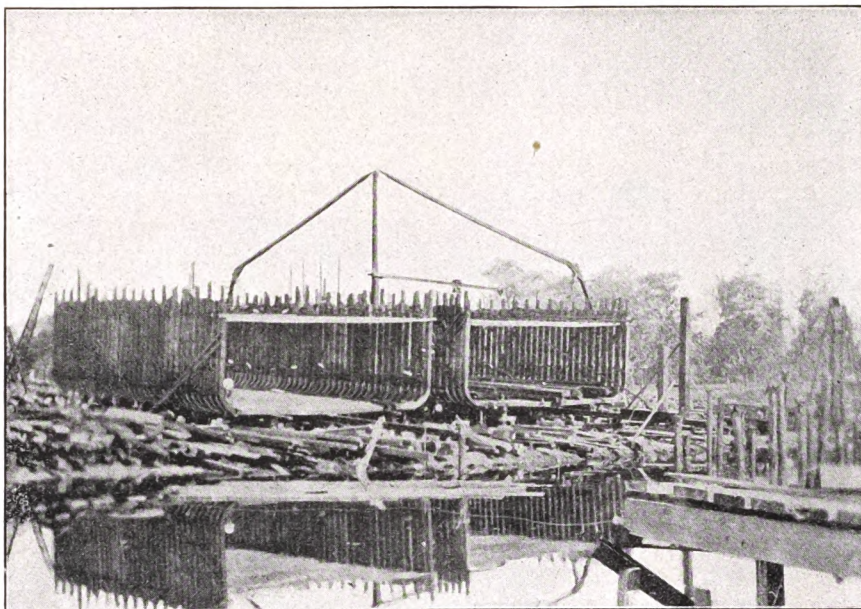
At Slidell, a ship yard covering 11½ acres, and including a woodworking plant, machine shops and auxiliary equipment for turning out large vessels, is being built. Capt. H. B. Saunders, formerly of New York, who is in charge, states that contracts for \$1,500,000 worth of ships have been taken. On May 15, 1916, the land now occupied by the Slidell company was the pine-covered shore of a deep bayou. There the Salmen Brick & Lumber Co. maintained its own ways and shops for repairing its large fleet of tugs, lumber schooners and barges. Since May, one large river packet, CLIPPER, and a number of small



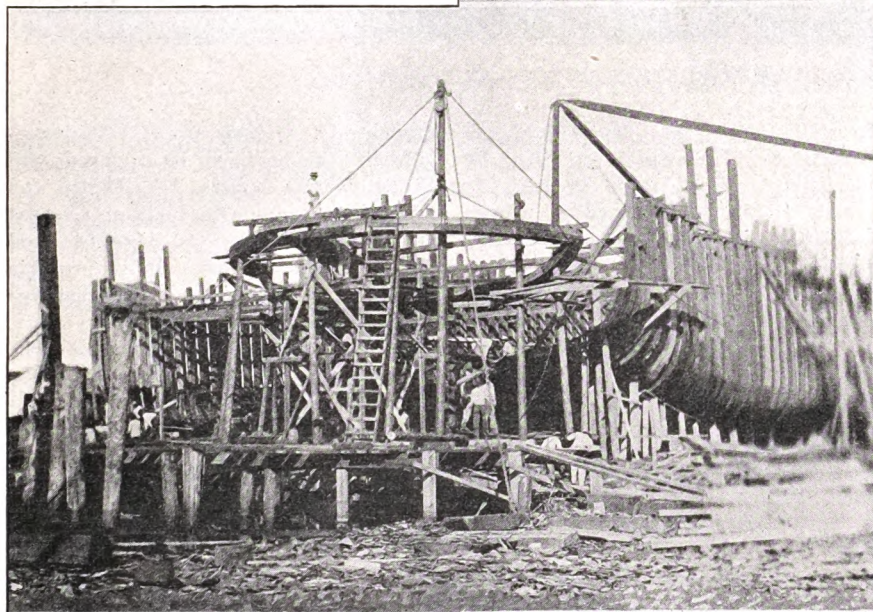
PUTTING THE PLANKING ON BALTIC NO. 2

boats have been built; three 2,000-ton deep-sea steamers completed, and the frames of three more erected.

The first two big vessels called BALTIC No. 1 and BALTIC No. 2, were launched Nov. 25 and March 25, respectively. The keels of two sister ships, BALTIC No. 3 and BALTIC No. 4, have been laid. Each is 227 feet long, 43 feet 11 inches beam with a draught of 16 feet 6 inches when loaded to capacity of 2,000 tons. They will be equipped with compound surface condensing engines of 1,000 horsepower, and each will have two Scotch boilers. The boilers, engines, bridge and officers' quarters will be aft, giving practically three-quarters of the length of the ship for its lumber cargo. The hatches will be long and wide and so arranged that timbers of great length can be put in the vessel's hold without difficulty.



FRAMES OF TWO 2,000-TON SHIPS
AT SLIDELL



ROUNDING UP STERN OF BALTIC NO. 1

Each steamer will be equipped with windlass and hoisting machinery, operated by six hoisting engines. Steering will be done by electricity, which will be supplied by a generator set. The pumps will be operated by steam. The pair of boilers will supply power for all engines.

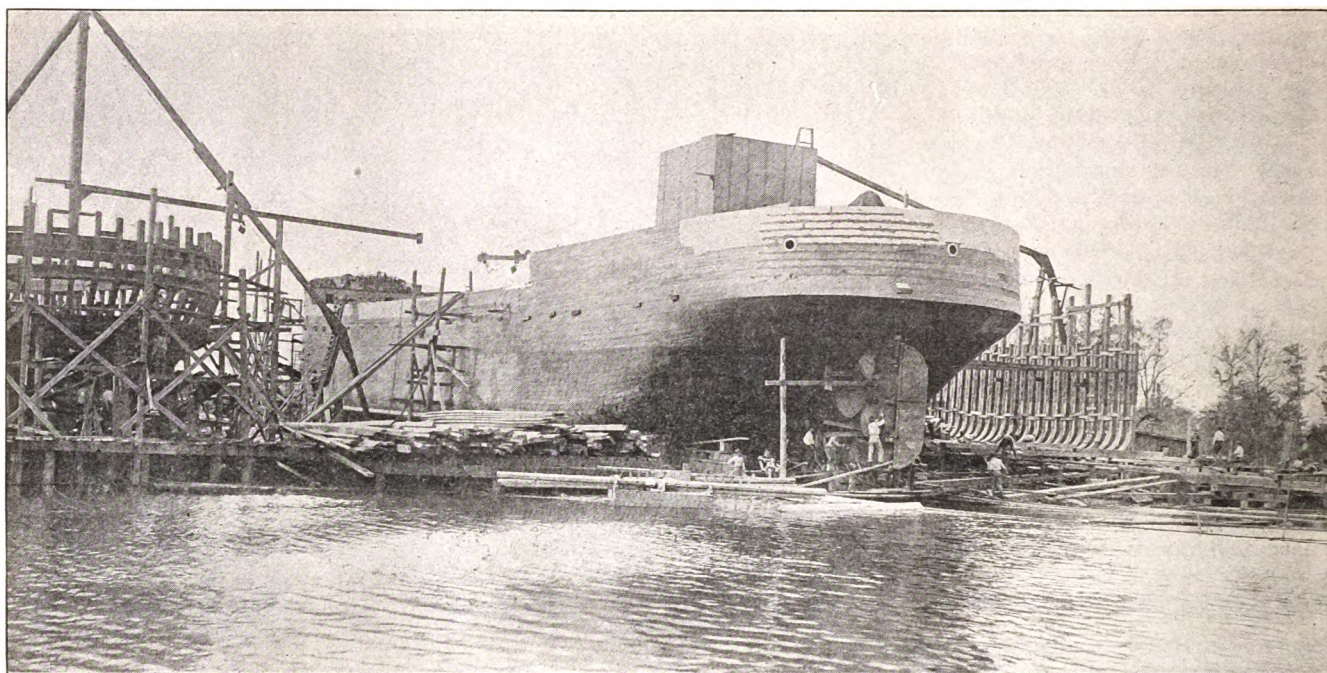
The quarters of the crew, under the forecastle head, are unusually roomy for this class and size of steamship. The design gives a clear sweep of the deck from the forecastle to the bridge and officers' quarters aft. Steel bulkheads, fore and aft, strengthen the frame and give added protection to the cargo. An interesting feature of one of the steamers recently launched is the long block of Louisiana oak, more than 2 feet square, which forms the sternpost. Similar timbers will be used on each of the other new steamers.

The frames of the steamers are Louisiana oak, the cross timbers and planking Louisiana yellow pine, and the finishings Louisiana cypress. Every inch of the wood work is from Louisiana. The ironwork, engines, and other equipment will be supplied by Charles L. Dimon, New York. The construction of these boats gives a new outlet for the oak and yellow pine products of Louisiana's forests. Iron and steel can be secured in abundance in Alabama, and brought to New Orleans at low cost on the motor barges of the Alabama & New Orleans Transportation Co.

The contract price for these four steamers is \$165,000 each, or \$660,000



LAUNCHING RIVER STEAMER AT SLIDELL



THREE STAGES OF CONSTRUCTION AS SEEN AT SLIDELL

for the fleet. All four will have been launched by mid-summer. They will be fitted out in New Orleans harbor by local ship chandlers, and will sail from that port, lumber laden, for Norway. They will be used in trade between Norway and other Scandinavian countries and England.

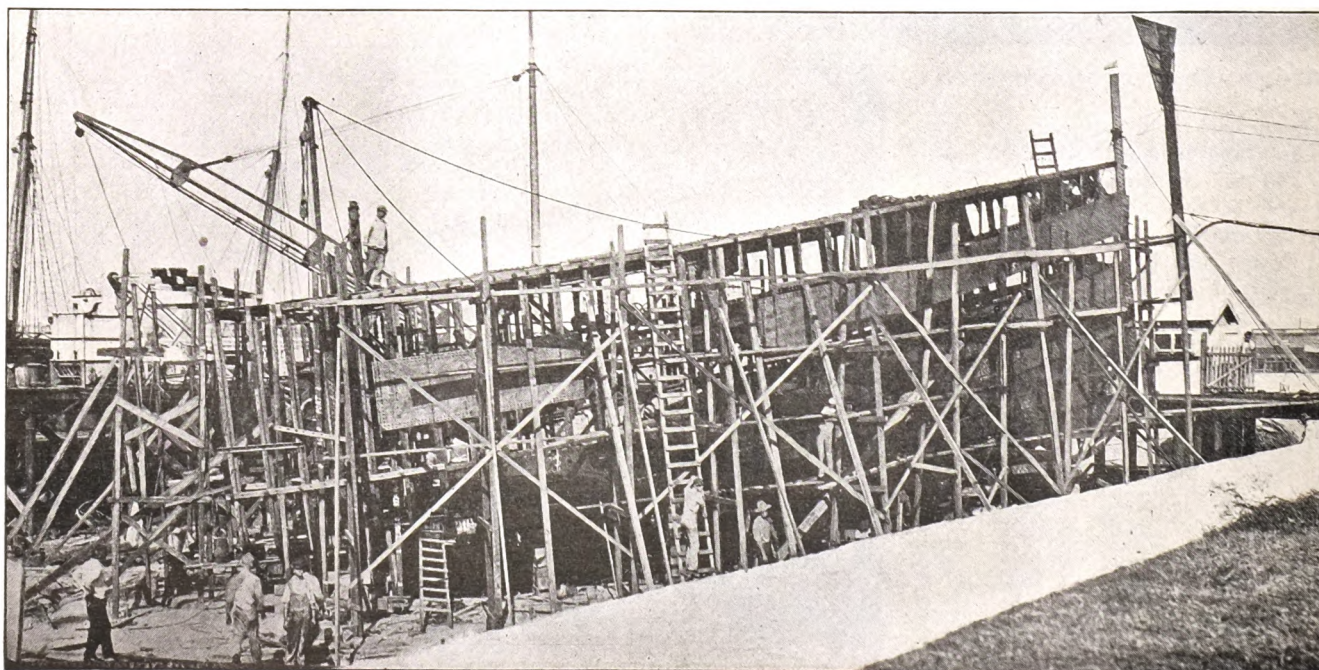
Mr. Dimon, who conceived the idea of the ship building company while on a visit to F. W. Salmen, secretary of the Salmen company, contracted for the first two steamers, but this contract, with an option for the second pair, has been sold to Hannevig & Johnsen, New York and Christiania, Norway.

After Mr. Dimon has disposed of his contracts to Hannevig & Johnsen, he immediately ordered three steamers to be built at the Slidell yard at a cost of \$270,000 for his own use in the Atlantic coastwise and West Indian trade. These are MAPLE, CYPRESS and LAUREL, and their keels were laid before the last lumber carrier had been launched. By the middle of February, Captain Saunders had six large ships building simultaneously in his yards.

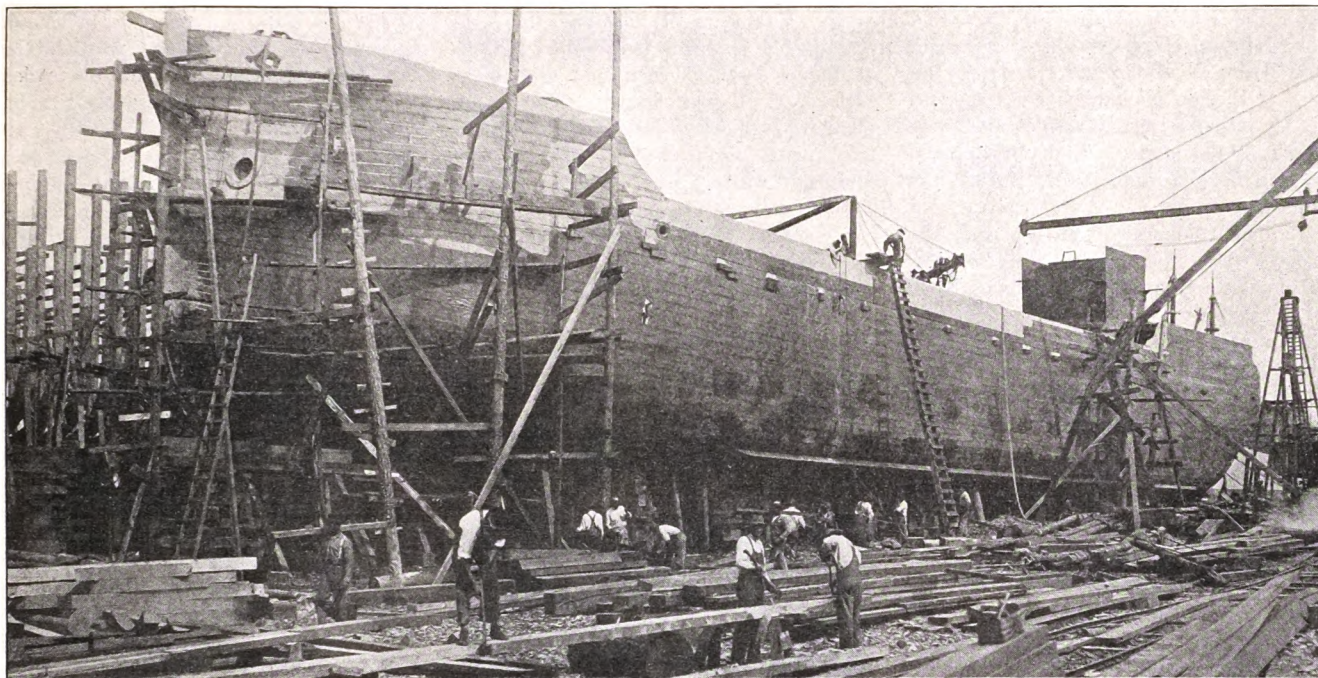
CYPRESS and LAUREL each are 200 feet long, 38 feet beam and draught, loaded, 13 feet of water. MAPLE is 180 feet long, 34 feet beam, and 11 feet

draught. The engines are of 1,000 horsepower. Each boat will be equipped with Scotch marine boilers. Mr. Dimon has asked for an option to duplicate CYPRESS and LAUREL as soon as these two and MAPLE are completed. It is probable according to Captain Saunders, that this contract also will be taken.

Included in the work taken at the Slidell yard are contracts with New York shipping firms, whose names Captain Saunders has not revealed, for two 2,000-ton auxiliary schooners. Each of these is to be built entirely of Louisiana woods, and each is to be 205 feet long, 40 feet beam and 19 feet



ONE OF THE TWO BARGES BUILT FROM RECOVERED WRECK



SHALLOW DRAFT 2,000-TON FREIGHTER UNDER CONSTRUCTION AT SLIDELL

draught, loaded. They will be completed this summer. These schooners will be three-masters, but each will be equipped, also, with crude oil engines, of sufficient power to maintain a speed of 10 to 12 knots an hour. These vessels will be used to carry lumber from the United States to other countries, probably Latin-America, and will bring back miscellaneous cargoes. The cost of these two schooners will be \$176,000.

The origin of this new ship building company is interesting. In the winter of 1915-16, Charles L. Dimon went to Slidell on a visit to one of the Salmen brothers. While there, he noticed with surprise the large quantity of pine, oak and cypress in close proximity to deep water. He at once suggested the reorganization of the dry dock and ship building company, which had been in

existence about 10 years, with the understanding that he be allowed to furnish the engines and machinery for the ships built there.

The result was that the Slidell Dry Dock & Ship Building Co. was formed and incorporated under the laws of Louisiana with a capital of \$100,000. This company, which absorbed the old dry dock company, has as officers: F. W. Salmen, president; L. T. Miles, vice president; Capt. H. B. Saunders, vice president and general manager; E. E. Hailey, secretary and treasurer, and a board of directors consisting of Fritz Salmen, J. Albert Salmen, W. E. Eddins, A. D. Canulette and the officers previously named.

The company spent \$20,000 for additions and machinery. It started with work valued at \$1,250,000 on hand, and with 320 men employed. The company purchased and laid out a tract on which it is erecting 24 houses to be used as homes by its workers. An apprenticeship system was installed Jan. 1, 1917, to protect the interests of the sons of employees of the corporation. A school was also opened for the benefit of both young and old.

"To illustrate," said Captain Saunders, as we stood on the stern of *BAL TIC No. 1*, and looked out over the 11 acres of busy works, "what can be done if a man hustles. I want to tell you that when I came here on May 15, 1916, the spot on which this ship rests, was a swamp. The best thing in it was a large pine tree, part of which is in this ship. The south should build ships for all purposes cheaper than any other part of the United States, for lumber is more plentiful here than it is along

deep water anywhere else, and the climate is such that the work can be carried on every month in the year."

And Slidell is not the only southern ship yard that is active. Demand for ships to replace those sunk or drawn into the European maelstrom, or to meet the imperative needs for American bottoms, is causing the expenditure of at least \$80,000 on three ships which have been lying idle in New Orleans harbor—two of them for six months and one for six years. One of these *PLAN DE GUADALOUPE*, which came into that harbor as a Mexican transport, has been bought by the New Orleans & New York Steamship Co., through J. B. Dunbaugh, and is being remodeled, even to new engines, at a cost of \$20,-



MISS KATHERINE SAUNDERS CHRISTENED THE FIRST SLIDELL BOAT

CAPT. H. B. SAUNDERS IN HULL OF *BAL TIC NO. 1*

000. She will be known as ATLANTA. The Johnson Iron Works, across the river from New Orleans, is doing this job, and also is extensively repairing ST. CHARLES, a steamer which had been practically abandoned. Both these steamers will be put in the New York-South American trade.

Another romance of the sea was revealed when the Allen & Friedrichs Co. bought from Capt. William Bisso for a small sum an old hulk which the captain had been using for a stationary, submerged coal barge, on the batture off the naval station for six years. The hull was that of a French steamer which had been caught in the eruption of Mt. Pelee, Martinique. She was so badly damaged that her owners abandoned her as a complete loss. The Stern Foundry Co., New Orleans, salvaged her, took out her machinery, plugged up the holes in her hull and sailed her as a barkentine to New Orleans harbor. There she lay idle until six years ago, the Stern company turned her over to Captain Bisso for a small sum. The captain, in turn, did not realize what he had, for he sold her at a low price to the Allen & Friedrichs Co., which spent \$10,000 in raising and scraping her. It was found that her plates were in fine condition and at least $\frac{1}{8}$ -inch thicker than those on modern ships. Experts estimate that it would cost at least \$175,000 to build this hull today. The contract to equip the ship, which is known as CARIOCA, has been let to a Mobile firm. She will come out of their hands as a modern barkentine, the cost of the repairs being about \$45,000. When completed she will be worth between \$200,000 and \$225,000. New Orleans shipping men say that Allen & Friedrichs Co.'s little venture in the sunken hull netted them approximately \$100,000 profit. CARIOCA will sail between gulf coast points and England.

Two Barges From One

The Johnson Iron Works also has built from old hulks taken from the river, the largest barges ever constructed in this part of the country. From the remains of an old barge, years ago condemned as unseaworthy, the Johnson works reconstructed two 15,000-barrel oil barges which, when completed, cost the Gulf Refining Co., Port Arthur, Tex., \$350,000.

The old barge was once a side-wheeler, with a rudder at each end, a transfer boat for the Frisco railroad, used to carry complete trains across the river. She was 350 feet long and 120 feet beam. Years ago, she broke amidships while in operation, was condemned, dismantled and left to lie idle along the river's edge. Then came several years of the European war, and the demand for derelicts brought to light this old

barge. Engineers of the Johnson works cut the old craft in two, added 65 feet of model bow to each end and made each craft 4 feet deeper. The result was two sea-going oil barges of large size, with iron hulls. They were equipped with Scotch boilers, pumps, anchors, towing machines, steam steering engines, electric lighting equipment and sails. Five hundred tons of steel was used in the reconstruction.

Builds Steel Tankers

The Alabama & New Orleans Transportation Co., now operating self-propelled steel freight barges between New Orleans and the Alabama coal fields,



FRED W. SALMEN, PRESIDENT SLIDELL DRY DOCK & SHIP BUILDING CO.

is building four steel tank ships for the Mexican Petroleum Corporation, New York. The ships are being built at Violet, 12 miles from New Orleans, where the Alabama company has its yards for building and repairing its barges. According to J. L. Brierton, general manager of the transportation company, each steamer will cost \$250,000. Each will be of 16,000-barrel, or 3000-ton capacity. They will be sister ships and will carry crude oil from Tampico Mex., to the refinery at New Orleans. The boats are of the Isherwood type, with twin screws and turbine-generators. Each will be 260 feet long, 37 feet beam and 19 feet deep. They will carry crews of 15 men. Practically all the steel used in these vessels has come from Birmingham, Ala., being brought to the plant at Violet by the motor barges of the transportation company. About \$30,000 was expended on the yards at Violet in preparation for building the steel tankers.

GEORGE T. LOCK, a large 4-mast schooner, built by the Clooney Construction Co., Lake Charles La., for the Aiken Towboat & Barge Co., Pensacola, Fla., has been delivered. The schooner is 184 feet long, 37 feet beam and 14 feet deep, and is equipped with auxiliary engines. She will carry 750,000 feet of lumber and will be used in the lumber carrying trade between gulf ports and Cuba. This is the seventh vessel built by the Clooney yards for the Pensacola firm in the past few years, and it is understood that another similar schooner has been contracted for. Lock cost \$50,000.

The Clooney Construction Co. also has completed a large transfer barge for the Gulf & Interstate railroad, which will be used for transferring trains between Port Bolivar and Galveston, Tex., a distance of 5 miles. The barge, which required four months in building, is 244 feet long, 42 feet wide and 12 feet deep, contains 425,000 feet of lumber and cost \$50,000. She carries three tracks and has a capacity of 15 large or 18 small loaded freight cars.

The first of a fleet of three large schooners to ply between New Orleans and Genoa, Italy, has been launched at Orange Tex. Henry Piaggio is the builder of the fleet of schooners and the other two will be built as rapidly as possible. This first vessel has a capacity of 1,500,000 feet of lumber. She was christened ORANGE CITY.

Gulf coast ship yards have been busy for months turning out schooners for the oyster fishermen. Four were launched at Biloxi and Pascagoula in one day. The Biloxi Ship Building Co., Biloxi, Miss., launched GERTRUDE B 30 gross and 22 net tons, 59 feet long for Francis Brander, Biloxi. The M. M. Flechas Ship Building Co., Pascagoula, Miss., launched the schooners LILY ROSE, HENRY CLARK and JOSEPHINE FOSTER, sister boats 57 feet long with tonnages of 23 gross and 16 net. The first two were built for the Devitt & Clark Packing Co., and the last for the C. B. Foster Packing Co., all of Biloxi.

The Wood Boiler Co., New Bedford, Mass., is removing its heavy machinery from its plant to Vancouver, B. C., in order to make six huge boilers for the Cunard company's new steamships that are under construction on the Pacific coast. The boilers will be too large to ship across the continent, so the company will transport its plant to the western coast. The work will require about four years. The future plans of the company in regard to its New Bedford business are indefinite, but it is proposed to continue an office there and perhaps a plant for boiler and repair work. The officials and many of the workmen expect to go to Vancouver.

4-Year Test of Motorship Fleet---III

In 1912, the East Asiatic Co. Operated Two Motorships and 13 Steamers; in 1915, 16 Motorships and No Steamers—Company's Decision to Use Oil-Engined Vessels

AS A result of its experimental operations of motorships, as outlined in the two preceding installments of this series published in the April and May issues of *The Marine Review*, the East Asiatic Co. decided in 1915 to employ only motorships in its oversea trade. In accordance with this policy, the company disposed of its steamships.

The record of the vessels owned and operated by the company at the end of 1912, 1913, 1914 and 1915, as disclosed in the accompanying tables, and in the April issue of *The Marine Review*, portrays graphically this complete transformation of the company's large fleet. In 1912, the company operated two motorships and 13 steamers; in 1913, four motorships and 11 steamers; in 1914, 11 motorships and 11 steamers, and in 1915, 16 motorships and no steamers.

The results of the operations of the motorships was closely studied by the company during the first years of the

test, and in the report for 1913, the company revealed that its policy of strengthening its motorship fleet was being steadily pushed. Its fleet was increased in April and June respectively, by two new motor vessels, SIAM and ANNAM, having a total carrying capacity of about 20,000 tons. Two steamers, ST. JAN and ST. THOMAS, with a total carrying capacity of 7,000 tons, were sold.

Converting Old Vessels

The report states further that:

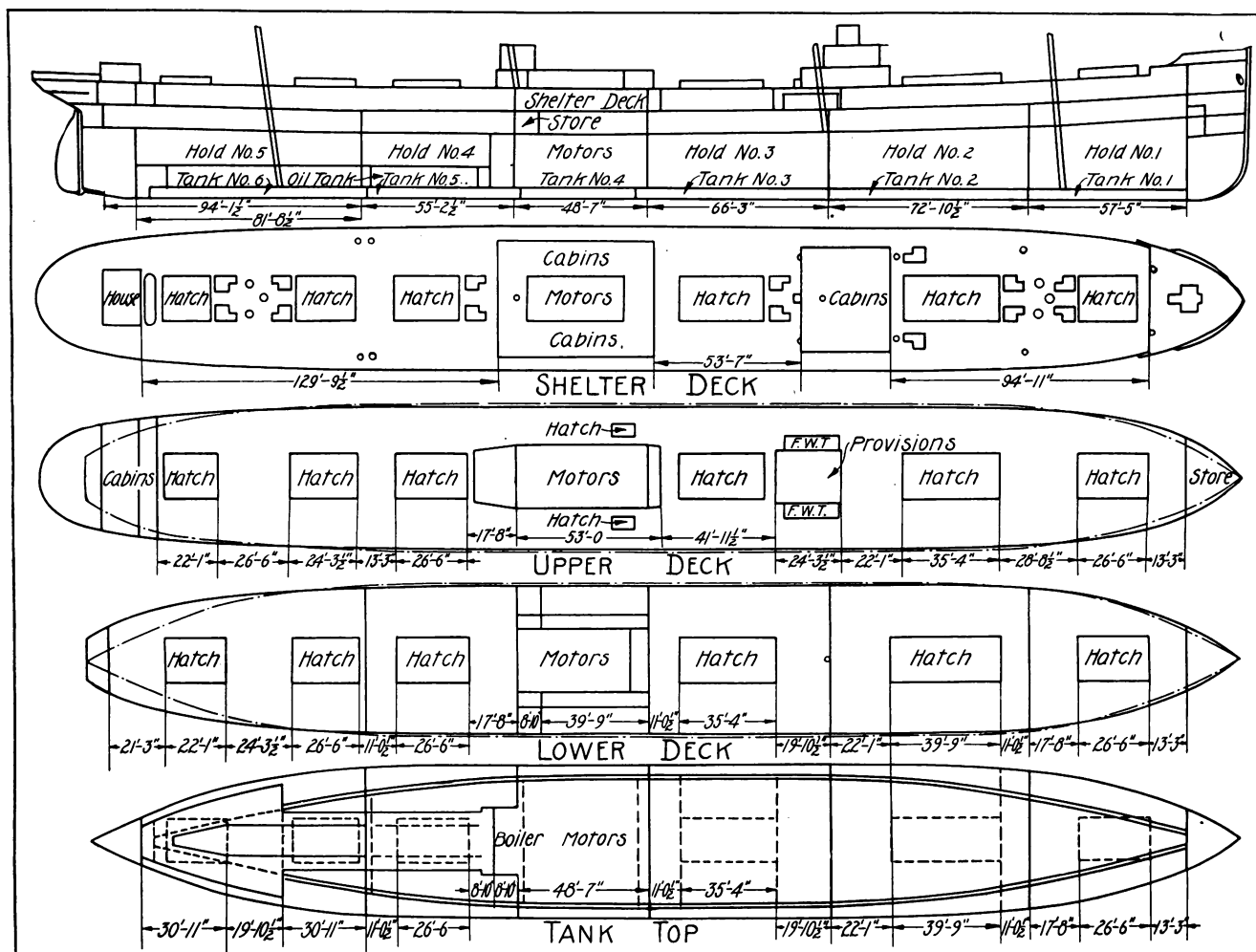
"The company's motorships have worked satisfactorily in every respect, and they have realized considerably larger net profits, as compared with the steamers.

"As regards the conversions and new constructions mentioned in the report for 1912, it is expected that diesel motors will be installed in April, May and June, in the steamers BANDON, CHUMPON and PANGAN respectively, the steam engines from these vessels being

fitted into TRANSVAAL, RHODESIA and NATAL, which are expected to be completed in March, May and June. The motorships FIONIA, FALSTRIA, LALANDIA, MALAKKA and TONGKING are expected to be ready for service in March, May, June, August and September respectively.

"In view of the success of diesel motors, the company has decided to build a sailing ship of a little over 5,000 tons dead weight, with a large spread of canvas, giving her a fair speed in the wind zones, and also fitted with an auxiliary screw, driven by a diesel motor of about 600 horsepower, which will give the ship a speed of about 7 knots in calm weather, and so carry her through the calm and variable zones. This ship will in time supply the company's motor and steam vessels with officers and crews all trained under conditions which are nowadays difficult to attain.

"An attempt has been made to increase the passenger traffic on the Bangkok route by means of the new motor



DECK PLANS AND PROFILE OF MOTORSHIP CHILE

East Asiatic Company's Fleet on Dec. 31, 1913

Name.	Year built	Tons gross registered	Tons deadweight	Indicated horse-power
Steamship Cathay	1898	4,075	6,600	1,600
Steamship Indien	1902	4,199	7,400	2,000
Steamship Tranquebar	1906	3,453	6,800	1,650
Steamship Arabien	1911	4,714	8,720	2,700
Steamship Kina	1911	4,714	8,720	2,700
Motorship Annam	1913	5,295	9,940	3,300
Motorship Siam	1913	5,295	9,940	3,300
Steamship Bandon	1909	3,485	4,900	1,600
Steamship Chumpon	1909	3,481	4,900	1,600
Steamship Pangan	1909	3,487	4,900	1,600
Motorship Selandia	1912	4,964	7,450	2,500
Motorship Jutlandia	1912	4,874	7,600	2,500
Steamship St. Croix	1907	2,540	3,500	1,350
Steamship Samui	1907	2,861	4,500	1,300
Steamship Bintang	1907	2,860	4,500	1,300
		60,297	100,370	

NEW VESSELS CONTRACTED FOR, TO BE DELIVERED DURING 1914 AND 1915

Name.	Tons gross registered	Tons deadweight	Indicated horse-power
Motorship Malakka	about 5,500	about 10,000	3,300
Motorship Tongking	about 5,500	about 10,000	3,300
Motorship Fionia	about 5,000	about 7,000	4,100
Motorship Falstria	about 4,500	about 7,000	2,500
Motorship Lalandia	about 4,500	about 7,000	2,500
Steamship Transvaal	about 4,000	about 7,000	1,600
Steamship Rhodesia	about 4,000	about 7,000	1,600
Steamship Natal	about 4,000	about 7,000	1,600
Sailing ship with diesel motor		about 5,000	600
	about 37,000	about 67,000	

vessels, and, without involving any decrease in the loading capacity of these ships, the main and bridge decks have been fitted with first-class passenger accommodation, which in every respect equals that provided for travelers by other eastern lines."

The report for 1914 states that:

"During the year the company's fleet has been increased by three new motorships having a total carrying capacity of about 27,000 tons, FIONIA, MALAKKA and TONGKING, delivered in March, September and October respectively, while three new steamers with a total carrying capacity of about 22,000 tons, TRANSVAAL, RHODESIA and NATAL, were put into service in April, June and July respectively. In addition, BANDON was put on the Bangkok line in November, after having diesel motors substituted for steam engines.

"Towards the end of the year, the company purchased a coast motorship with a carrying capacity of about 600 tons and a combined sail and motorship having a capacity of about 500 tons, both for the West Indian coast service.

The motorship MALAKKA on her first voyage homeward from San Francisco to Copenhagen, stranded on Cerros island, south of California, on Dec. 18; she has since become a total wreck and has been abandoned. The ship was fully insured.

"The average age of the ships now in service is 4.12 years and the average price £8 8s 9d per ton deadweight.

"The motorships have fulfilled all expectations indicated in previous reports.

New Boats Ordered

"In order to keep the development of the shipping and trading interests as far as possible on a level basis, and with a view to principally employing its own ships on the various routes, the company has contracted during the past year with Messrs. Burmeister & Wain Maskin & Skibsbysgeri for building four new motorships of SIAM class, each having a carrying capacity of about 10,000 tons. The vessels will be named PANAMA, AUSTRALIEN, COLUMBIA and CHILE, and are expected to be ready for delivery in March, July, September and December, 1915, respectively.

With regard to some of the new ships under construction, referred to in the report for 1913, the company has been disappointed in respect to delivery; the two new motorships FALSTRIA and LALANDIA have been delayed about 10 months and are now only expected to be delivered in February and March, 1915, respectively. The motorships BANDON, PANGAN and CHUMPON were delayed six months beyond the time mentioned in the last report.

"The five-masted sailing ship mentioned in the report for 1913 will be named KOBENHAVN and is expected to be delivered some time in the summer of 1915.

"The expenses for the ships' daily upkeep, repairs and classifications have been provided out of revenue, as well as a depreciation of 6 2/3 per cent of the original value, the basis being 15 years' amortization.

In its report for 1915, the company stated that:

"During the past year its fleet was augmented by five new motorships, FALSTRIA, PANAMA, AUSTRALIEN, COLUM-

East Asiatic Company's Fleet on Dec. 31, 1914

Name.	Year built	Tons gross registered	Tons deadweight	Indicated horse-power
Steamship Cathay	1898	4,075	6,600	1,600
Steamship Indien	1902	4,199	7,400	2,000
Steamship Tranquebar	1906	3,453	6,800	1,650
Steamship Bintang	1907	2,860	4,500	1,300
Steamship Samui	1907	2,861	4,500	1,300
Steamship St. Croix	1907	2,540	3,500	1,350
Motorship Bandon	1909	3,485	4,900	1,600
Motorship Chumpon	1909	3,481	4,900	1,600
Motorship Pangan	1909	3,487	4,900	1,600
Steamship Arabien	1911	4,714	8,720	2,700
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Motorship Selandia	1912	4,964	7,450	2,500
Motorship Jutlandia	1912	4,874	7,600	2,500
Motorship Annam	1913	5,295	9,940	3,300
Motorship Siam	1913	5,295	9,940	3,300
Motorship Fionia	1914	5,218	6,820	4,100
Motorship Tongking	1914	5,229	9,812	3,300
Steamship Rhodesia	1914	4,112	7,250	1,600
Steamship Natal	1914	4,170	7,350	1,600
Steamship Transvaal	1914	4,400	7,440	1,600
Motorship Anholt	1913	255	380	200
Motorship Samso	1914	387	545	160
		84,068	139,967	

NEW VESSELS CONTRACTED FOR TO BE DELIVERED DURING 1915.

Name.	Tons gross registered	Tons deadweight	Indicated horse-power
Motorship Falstria	about 4,500	about 7,000	2,500
Motorship Lalandia	about 4,500	about 7,000	2,500
Five-masted sailing ship with diesel motor Kobenhavn	about 3,845	about 5,800	600
Motorship Panama	about 5,300	about 9,812	3,300
Motorship Australien	about 5,300	about 9,812	3,300
Motorship Columbia	about 5,800	about 10,400	3,300
Motorship Chile	about 5,800	about 10,400	3,300
Motorship Laeso	about 800	about 700	350
Motorship Sejro	about 800	about 700	350
	about 36,645	about 61,624	

East Asiatic Company's Fleet on Dec. 31, 1915

Name.	Year built	Tons gross registered	Tons dead-weight	Indicated horse-power
Motorship Bandon	1909	3,485	4,900	1,600
Motorship Chumpon	1909	3,481	4,900	1,600
Motorship Pangan	1909	3,487	4,900	1,600
Motorship Selandia	1912	4,964	7,450	2,500
Motorship Jutlandia	1912	4,874	7,600	2,500
Motorship Annam	1913	5,295	9,940	3,300
Motorship Siam	1913	5,295	9,940	3,300
Motorship Anholt	1913	255	380	200
Motorship Fionia	1914	5,218	6,820	4,100
Motorship Tongking	1914	5,259	9,812	3,300
Motorship Samso	1914	387	545	160
Motorship Falstria	1915	4,358	7,000	2,500
Motorship Panama	1915	5,259	9,812	3,300
Motorship Australien	1915	5,259	9,812	3,300
Motorship Columbia	1915	5,569	10,400	3,300
Motorship Chile	1915	5,569	10,400	3,300
		68,014	114,611	

NEW VESSELS CONTRACTED FOR, TO BE DELIVERED DURING THE NEXT FIVE YEARS.

Twenty-three new vessels contracted for as mentioned in the report, including the sailing ship KOBENHAVN, with a total carrying capacity of 237,200 tons.

TUGS, LIGHTERS, ETC., ON DEC. 31, 1915.

	Tons gross registered	Tons dead-weight
COPENHAGEN:		
Motor lighter Transport No. 1.....	100	150
Five lighters	362	590
BANGKOK:		
28 seagoing and river lighters.....	2,294	3,355
Seven tugs and steam launches.....	217	...
	2,973	4,095

BIA and CHILE, having a total carrying capacity of 47,424 tons. In accordance with the company's general principles, that is, as far as possible to maintain its fleet on a level with modern developments, it was decided in the future principally to employ motorships on the oversea routes. The confidence placed in this new motor propulsion as set out in the reports for 1910 to 1914 has not been shaken. Since then Messrs. Burmeister & Wain, Ltd., have succeeded in further improving their diesel motors both in regard to perfect working and reduction of oil consumption. About the middle of the year the company decided to dispose of all its steamers. The steamships SAMUI and BINTANG were sold to Norway whereas the steamships INDIEN, TRANQUEBAR, ST. CROIX, KINA, ARABIEN, RHODESIA, NATAL and TRANSVAAL were to be transferred to the newly formed Danish Steamship Co. Orient, Ltd., as they returned from their current voyages, but in compliance with the agreement between the two companies these steamers until further notice will continue to serve the East Asiatic Co.'s routes for account of the Danish Steamship Co. Orient, Ltd. Further, the company has sold to Norway,

for later delivery, its three smallest single-screw motorships, BANDON, CHUMPON and PANGAN, of a total carrying capacity of 14,700 tons.

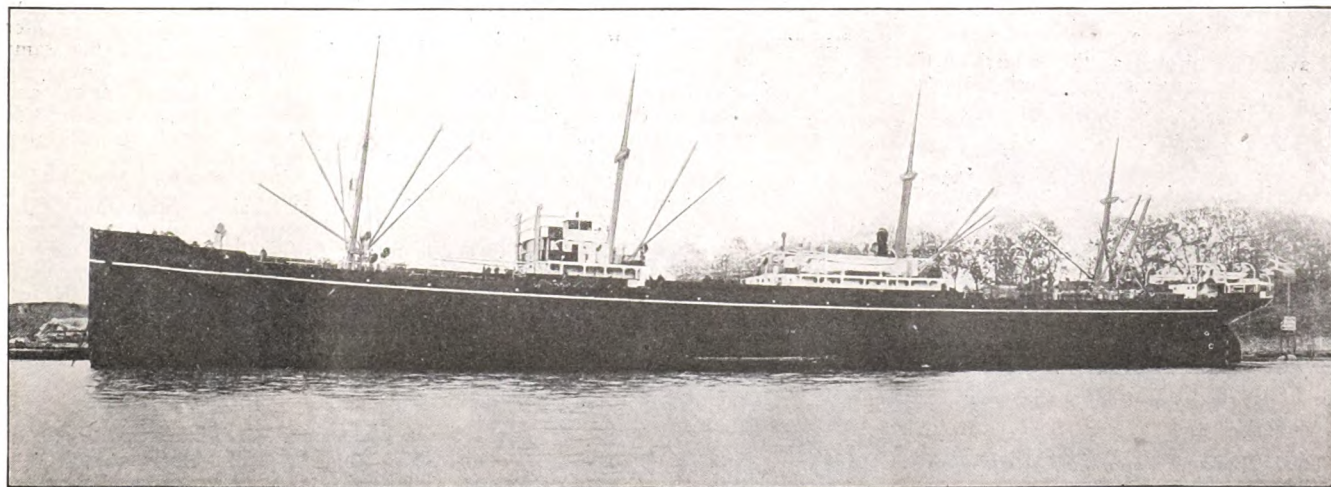
"On the other hand, the company has ordered from Messrs. Burmeister & Wain, 20 twin-screw motorships of a total carrying capacity of about 230,000 tons, including eight vessels of about 10,400 tons, six of about 11,800 tons, and six of about 12,800 tons each, with a total indicated horsepower of 86,400, two vessels having 3,300, 12 4,000, and six 5,300 indicated horsepower each. The average speed of these vessels will be respectively 11½, 12 and 13 knots. The 12 largest ships will be fitted with refrigerated accommodation for the conveyance of fruit. Further, the company has ordered from the A. S. Frederikshavns Vaerft & Flydedok (Frederikshavn's Shipbuilding & Floating Dock Co., Ltd.), two motor vessels of 700 tons each.

"On May 5, the company's oldest steamship CATHAY, was destroyed off the English coast by an explosion from some outside source. Including the lost CATHAY, but excluding the three motorships, the company's fleet has decreased by 11 ships having a total carrying capacity of 72,780

tons, against 23 ships of a total carrying capacity of 237,200 tons having been ordered for delivery in the next five years.

"Due to the war, the motorship FALSTRIA was delivered from the builders in Scotland only at the end of March, and as the time of delivery of the motorship LALANDIA became very uncertain, the contract with the builders was cancelled. As for the 5-mast sailing vessel KOBENHAVN which, as previously stated, is in course of construction with Messrs. Ramage & Ferguson in Leith, the time of delivery is also uncertain.

"Notwithstanding the addition of new vessels, the company's fleet has temporarily decreased during 1915 by 25,356 tons. The average age of the present fleet has thereby been reduced to 2.18 years. The average cost after allowing for depreciation stands at £10 12s per ton deadweight. According to the above building program, the fleet will for some years not exceed this average age, and will consist exclusively of twin-screw motor vessels. Although the vessels sold to the Danish Steamship Co. Orient had not all been handed over at the end of the year, the whole decrease in 1915, or 72,780 tons, is taken into account in the accompanying list of ships."



COLUMBIA—ONE OF THE NEWEST EAST ASIATIC CO.'S MOTORSHIPS

On the Coasts, Lakes and Rivers

What's Doing and Who's Doing It

News of Lakes as Season Opens

By C. M. Krauss

A BOAT line to run on the Great Lakes, is being promoted by Twin City capital. The object is to reduce the cost of shipping to Buffalo and other eastern points from Minneapolis and St. Paul. The line will have its western terminus in Gladstone, Mich., where direct rail connections will be made with the Twin Cities. The steamers LAKEPORT, LAKELAND and LAKEWOOD, each of 3,000 tons register, have been purchased by the new line.

The steamer WESTMOUNT was launched April 7 at the yard of the Collingwood Shipbuilding Co. The new boat, which was built for the Montreal Transportation Co., is 550 feet long, 58 feet beam and 31 feet deep. She will be placed in commission this month.

The steel tug FRANCES B. HACKETT, operated by the Hackett Towing & Wrecking Co., Detroit, and Amherstburg, Ont., has been sold to E. P. Morse Jr., Brooklyn, N. Y. HACKETT is 96 feet long, 24 feet beam and 14 feet deep. It is believed that the purchase was made for the federal government. Mr. Morse is said to be seeking other lake vessels.

American lake builders have 61 steamers under contract for next year's delivery. All the boats, except one which will be a large oil carrier, are for salt-water service. The American Shipbuilding Co. closed contracts for 34 ships; the Toledo Shipbuilding Co. and the Manitowoc Shipbuilding Co. for five each.

The property of the Reid Wrecking Co., except the steamer SPOKANE and the dry dock at Port Huron, has been sold to the Canada Steamship Lines, Ltd. Capt. Thomas Reid will act as manager.

Navigation opened at the straits April 22 with the passage of the steamers HENRY CORT, J. B. NEILSON and the tug ALABAMA. While working in the ice in the straits CORT lost all the buckets off her wheel and NEILSON lost two buckets. After being towed to and repaired at Sault Ste. Marie CORT left that port on May 2 to assist NEILSON in working among the ice fields at Whitefish point.

Charles Robb, retired lake shipmaster, died at Lorain, O., April 30, aged 82 years. Captain Robb began his career on the Great Lakes 52 years ago. He was a sailor on the ocean before becoming a lake seaman.

The Cleveland steamer D. R. HANNA, of the Hutchinson fleet, commanded by Capt. Samuel B. Massey, was the first boat to reach Duluth. She reached that

port at 3:50 p. m., May 1, and was followed five minutes later by the steamer J. G. BUTLER JR., also of the Hutchinson fleet. The steamer HARVESTER, which was the first boat to pass the Soo, was the third to make Duluth.

The first total loss of the season was the steamer CASE, which was destroyed by fire at East Sister island May 1.

The Great Lakes Transit Corporation, Buffalo, has closed the sale of the steamer GRANVILLE A. RICHARDSON to the Lake Transportation Co., Mentor, O., with offices at Cleveland.

The steamer EMORY L. FORD, which held a cargo of 460,000 bushels of wheat at Port Huron all winter, left that port on April 1. She arrived at the Dakota elevator in the Blackwell canal, Buffalo, on the afternoon of April 23 and the unloading of her cargo was started immediately. FORD arrived in good shape, having bucked very little ice.

The Northern Transportation Co., Baltimore, has purchased the steamer NEOSHO which has been idle at Milwaukee for the last eight years. She was formerly owned by the Gilchrist Transportation Co., Cleveland.

The steamer HARVESTER, of the Wisconsin Steel Co., opened navigation through the American locks at the Soo. She arrived at Sault Ste. Marie shortly before noon, April 24.

The Hamilton Transportation Co. sold the lumber barge STEWART to White, Gratwick & Mitchell, North Tonawanda, N. Y., for \$20,000. She will tow with the steamer EDWARD SMITH.

The Lake Carriers' Association has adopted a schedule of wages for the opening and until further notice, which calls for an advance of about 20 per cent over the 1916 opening card for all the men employed on the boats except the masters. The wages of the captains will be fixed by the owners and managers of the different fleets as heretofore.

The Buffalo Steamship Co.'s 12,000-ton steamer FRANK H. GOODYEAR was launched at the Ecorse yard April 26. GOODYEAR is 600 feet long, 60 feet beam and 32 feet deep.

The steamer JOHN A. DONALDSON, of the Becker fleet, was the first boat of the Lake Michigan grain fleet to reach

Buffalo. She made that port April 26 and was followed by other grain carriers.

The steamer MARTIN MULLEN arrived at Cleveland April 27 with the first cargo of ore delivered at a Lake Erie port this season. She was loaded at Escanaba by Corrigan, McKinney & Co.

The American Shipbuilding Co. has purchased five acres adjoining its plant at Lorain and will make extensions.

Capt. Gerald Stufflebeam, one of the veteran commanders of the Goodrich Transit Co., Chicago, has been promoted to master of the flagship ALABAMA. Capt. Wm. E. Franklin, the former commander, has been promoted to assistant superintendent of the line.

The first oil-burning steamer ever built at Detroit is nearing completion. She is being built for the naval commission of the Argentine republic.

The Globe Ship Building Co., Superior, Wis., organized some time ago to undertake a number of contracts for new boats for various interests, expects to be able to begin actual construction work by May 15, so that the first boat will be launched before the close of navigation. A new plant located on the Hughitt avenue slip is being built at a cost of \$10,000.

The first ship to open up navigation from Buffalo harbor was SHENANGO, commanded by Capt. Frank Ott and towed by the tug GEORGIA. She began her initial trip of the season at 10:00 a. m., April 12, through the south gap and was followed by the big freighter WILLIAM P. SNYDER JR., of the same line, commanded by Captain Jones, and in tow of the tug JOHN TRUBY, and COL. J. M. SCHOONMAKER, Captain Slade commanding, and towed by the tug PENNSYLVANIA.

The Great Lakes Steamship Co.'s steamer HORACE S. WILKINSON was launched April 21 at the yards of the Toledo Shipbuilding Co. WILKINSON is 600 feet long, 60 feet beam and 32 feet deep and is the largest vessel ever built at the Toledo yard. She will be in charge of Capt. Ralph Lyons. Benjamin Ray will be chief engineer.

The steamer HOMER D. WILLIAMS, of the Pittsburgh Steamship Co., was launched April 21 at the Lorain yards of the American Ship Building Co. The vessel was christened by Miss Marjorie

Williams, daughter of Homer D. Williams, president of the Carnegie Steel Co. for whom the vessel was named. The launching program included the dedication of an American flag purchased by 250 riveters and their helpers, who worked on the hull of WILLIAMS.

* * *

TOULOUSE, a 260-foot steamer of 2,045 gross tons, was launched from the yards of the Superior Shipbuilding Co., Superior, Wis., April 21. She is the first steamship to be launched for French interests at an inland yard of the United States. The vessel was christened for the French city, which is the headquarters of the owners.

* * *

The steamer GRAND ISLAND was the first freighter to arrive at Ashtabula. She docked at this port April 21 from Cleveland and loaded coal for the upper lakes.

* * *

Capt. W. D. Ames has resigned as master of the steamer JOHN DUNN JR., of the Great Lakes Steamship Co. This summer will be the first Captain Ames has spent ashore in 40 years. He has been in command of steamers 27 years. Capt. George W. Pearce will sail DUNN. Other changes will be made among the masters of the fleet.

* * *

Th ice breaker ALGOMAH reached the Soo at 1:30 p. m., April 17, after opening the channel between Sault Ste. Marie and Detour. Ten days of hard work were required to accomplish this.

* * *

The 600-foot freighter MIDVALE was launched at the Ashtabula yard April 18. She is the largest steamer ever launched at Ashtabula and was built for the Johnstown Steamship Co. and will be a part of the Hanna fleet. Capt. P. L. Millen will bring the new boat out.

* * *

The steamer CODORUS was purchased by Boland & Cornelius, Buffalo, from the Great Lakes Transit Corporation. She will be altered for bulk freight trade on the lakes before she goes into commission for the season.

* * *

The steamer TIoga has been purchased from the Great Lakes Transit Corporation by Boland & Cornelius for the Massey Steamship Co., Duluth.

* * *

Silas Hitchcock, Vermillion, O., formerly a member of the firm of M. A. Hanna & Co., died April 11 at the age of 60 years. Mr. Hitchcock was one of the best known men connected with the lake trade. He retired from business about 10 years ago.

* * *

The barge TILDEN, operated by the Hamilton Transportation Co., was purchased by the Mullen Coal Co., Detroit. TILDEN will be used in the coal trade between Ohio ports and Detroit river points.

* * *

A change in the lights and their supporting structures marking harbor entrances in Lake Michigan and Green Bay, effective about May 15, has been announced by the United States bureau of lighthouses. The lights will indicate by their color the side on which they must be passed in entering harbors. The system is similar to that prescribed by statute for coloring buoys and in accordance therewith red lights on red structures

will be found on the starboard hand and whitelights on white (or black) structures will be found on the port hand in entering the harbors. When both sides of an entrance are marked, vessels will pass between red and white lights or correspondingly colored structures. Characteristic periods of flashing or occulting lights will identify localities, as heretofore.

* * *

The United States engineer's office, Chicago, has sent to the United States lake survey office the following lists of lights which will be maintained by the contractors during the construction of rubble-mound breakwaters at Chicago Harbor, Ill.: A pole showing a fixed red light at the south end of the southerly extension of exterior breakwater, now nearing completion; a black gas and bell buoy No. 1, showing a fixed white light, 500 feet south of the pole light, to mark the north end of

work about to begin upon the south arm of the exterior breakwater; a red gas buoy, No. 2, showing a fixed red light, located about 1,000 feet south of the black gas and bell buoy No. 1.

This red gas buoy will be moved southward as work progresses and the space between gas buoys Nos. 1 and 2 will be occupied by the fleet of the contractor and for deposit of stone. Under no condition should vessels pass between the two gas buoys. The entrance to the harbor is between the pole red light and black gas and bell buoy No. 1.

During the construction of rubble-mound breakwater at Indiana Harbor, Ind., the contractor will maintain a red gas buoy, showing a fixed red light, located about 2,600 feet east of the west end of the stone breakwater, to mark the east end of the stone fill and to be moved eastward as that fill progresses. Under no conditions should vessels pass west of this buoy.

Around New York Harbor

By M. C. Lynch

A STATE-OWNED steamship service between Victoria, Vancouver, New York and Philadelphia by way of the Panama canal is to be established by the government of British Columbia. The government has purchased two steamships of 10,000 tons each. The first vessel is expected to be put into service for passengers and freight in July.

* * *

Charles Kaufman, Boston, is to assume charge of the third class department in the New York office of the Cunard line, made vacant by the appointment of H. H. Kellerman to the management of the Cunard and Anchor line offices in Pittsburgh. Mr. Kaufman has been in the service of the Cunard line in its Boston office for 14 years.

* * *

The Erie, Oswego, Champlain, Cayuga and Seneca canals opened May 15. This marks the placing in commission of the entire route of the barge canal between Troy and Oswego.

* * *

Edgar E. Lethbridge, new president of the Maritime Association was duly installed in his new office April 26. The retiring president, Joseph B. Morrell, at an organization of the new board of directors, handed the gavel over to Mr. Lethbridge and bespoke for him the same hearty co-operation and support which had been accorded to him during his term of office. At the organization of the board John Dowd was re-elected secretary for the ensuing year. William H. Douglas and William Simmons were elected members of the executive committee to serve with the president on this committee. Bernard L. Tim and Edgar F. Luckenbach were appointed members of the finance committee to serve with Vice President Rios. C. Lynn Bundy was re-elected superintendent, and Walter S. Smith assistant superintendent, for the ensuing year.

* * *

A specially designated committee of the New York Tow Boat Exchange, composed of V. E. Downer, W. F. Dalzell and J. H. Moran, has forwarded to the President resolutions setting forth the desire of the members of the exchange to support, and to be of service

in any capacity whatsoever to the government, the army, the navy and other departments.

* * *

B. W. Lougheed, Inc., has filed dissolution papers and will reorganize under the style of B. W. Lougheed & Co., Ltd. The business of the new company will be conducted at 11 Broadway.

* * *

Negotiations for the sale of the Plant line steamer HALIFAX have been completed. This removes the last of the Plant liners. The vessel will shortly be sent from Halifax to New York for delivery to the new owners who are going to place her in the transatlantic trade. HALIFAX was built at Glasgow in 1888. She is 250 feet long, 35 feet beam, 21.6 feet depth of hold, net tonnage 1,078, gross tonnage 1,875, with accommodations for passengers. HALIFAX will load a general cargo for Lisbon, Portugal.

Along Puget Sound

By F. K. Haskell

In an effort to prevent a shortage of licensed steamship officers on coasting and Puget sound vessels drastic action was requested at a meeting held in Seattle between John K. Bulger, supervising inspector of hulls and boilers of this district, and 100 Puget sound boat owners. Inspector Bulger declared that the boats must be kept going and recommended to Secretary of Commerce Redfield that portions of the La Follette law governing crews on Puget sound steamers be suspended and that action be taken to give special licenses to capable firemen so they will be able to stand a watch in the engine rooms of Puget sound tugboats. On account of the government's call for engineers and masters, the working force of Puget sound shipping men has been reduced to such an extent that it is impossible, owners declare, to secure men to operate their vessels.

* * *

The Standifer-Clarkson Co., Vancouver, Wash., has closed for two additional vessels for the government. It has also closed for a third auxiliary

ship for the firm of Libby, McNeil & Libby, and will shortly complete the 4,000-ton steamer for the Sugar Products Co.

The Columbia River Shipbuilding Co. has commenced the construction of their new yard at Vancouver, Wash.

Capt. Augustine Saenz, 35, master of the Chilean bark NELSON, widely known among the shippers of the Pacific coast and Australia, died in Tacoma after an illness of three months. Capt. Vebcenay, of the Chilean ship PUERTO MONTE, and Captain Blanco, of the Chilean ship CURZON, were at his bedside when the end came.

The Alaska Pacific Navigation Co., the Seattle concern which constructed the motorship OREGON, will shortly begin the construction of two 3,500-ton wooden vessels of the same type. The orders have been placed for full diesel oil engines that will power the two ships. Each vessel will have engines of 500 horsepower. While the pair of wooden craft will be built on lines similar to OREGON they will be larger, measuring 260 feet over all with a beam of 45 feet and a depth of 25 feet. They will be used in Alaska freight service.

Adam Patterson Sr. and Adam Patterson Jr., Los Angeles and Nevada, and A. M. McDonald, Salt Lake City, have recently organized a ship building concern at \$500,000 and will locate their plant at Port Townsend, Wash. The head of the company will be in Seattle under the management of Adam Patterson Sr. A. M. McDonald, for the past 14 years in the ship building business at Clyde, Scotland, will manage the plant at Port Townsend.

One of Puget sound's most active ship building concerns is the Western Boat-building Co., Tacoma. The concern makes a specialty of fishing and cannery boats. It is under the management of M. A. Petrich, William Vickat and J. Martinac.

The National Shipbuilding Co., Seattle, has signed contracts for the construction of two 3,500-ton wooden ships for eastern interests for \$700,000 for the pair. Each vessel will be equipped with two engines of 380-horsepower each.

Boston Bay News

By George S. Hudson

Albert Smith, prominent in New England shipping circles, has been appointed general manager of the Eastern Steamship Lines, Inc., and will have charge of steamers running between Boston and ports in Maine as well as those on the Yarmouth, N. S., line. He succeeds F. A. Jones and J. F. Masters, who have been connected with the company many years.

Massachusetts nautical schoolship RANGER, Capt. P. W. Hourigan, U. S. N., has sailed from Boston on a month's cruise with 106 cadets who will be instructed in gunnery as well as in navigation and engineering.

A profitable 12-months charter has been secured for barge CIENFUEGOS, owned by the Staples Coal Co. The

vessel will receive \$4 per ton on coal between Norfolk, Va., and Boston. Other barges have been fixed at the same rate.

Excursion steamers have started operations in Boston harbor despite war conditions by special permit from the navy department.

Capt. R. DeL. Hasbrouck, U. S. N., has been appointed captain of the port of Boston. Entrance to the harbor is limited to the North Broad Sound channel which is guarded by a net and patrol craft. The South channel and Narrows channel are closed to traffic. Vessels are not allowed to enter port between sunset and sunrise.

Six Boston-owned colliers were held up by striking crews and New England was seriously threatened with a fuel famine. The ships were on a long-term charter at about 60 cents per ton, owners declaring they would lose thousands of dollars a month if the new wage scale should be granted. Two ships owned by the Luckenbachs also were temporarily tied up. These ships, however, are newly chartered at \$5 per ton between Chesapeake bay and Boston and the scale was immediately granted, as follows: Seamen and quartermasters, \$60; boatswains, \$70; carpenters, \$75;

oilers and water tenders, \$65; coal passers, \$60.

Contracts for repairing German and Austrian steamships seized at the port of Boston have been awarded by United States shipping board to the Atlantic Works, Bertlesen & Petersen and Boston Engineering Co. The job is the largest of its kind ever undertaken in New England and will require services of a thousand artisans. OCKENFELS and ERNY, not so badly damaged, will be ready in one month while the others will require about three months. The first two will be cleaned and painted in Simpson's dry dock; the others will go into the dry dock at the Boston navy yard.

A steamship company to operate between Boston and Halifax, N. S., and St. John's N. F., is being organized in Boston with D. W. Simpson, ship broker, as manager. Two ships with accommodations for 100 passengers each and considerable freight capacity are being sought for the new service.

German sailors from seized ships have been placed in a detention camp on Gallups island where quarantine hospitals are located. New buildings have been erected and the 280 enemy aliens are to have a 9-acre market garden.

New Orleans Wants Canal

By H. H. Dunn

THE association of commerce and other civic bodies of New Orleans are working with the city government to construct a deep-water canal across the city, connecting the Mississippi river with Lake Pontchartrain, thus furnishing a short cut for shipping to the Gulf of Mexico. In addition, this canal will provide ideal, quiet-water sites for ship yards. Negotiations have been entered into with a northern ship building company to erect a plant here.

The Alabama & New Orleans Transportation Co., which has turned its barge yard at Violet, La., into a general boat-building plant, has started work on two more self-propelled steel barges for the Inland Navigation Co., which is now operating a line of power barges between New Orleans and St. Louis.

The United Fruit Co. is endeavoring to place contracts for 10 more steamers, according to Crawford H. Ellis, general manager. So far no yard has been found to handle them.

Clooney ship yards, Lake Charles, La., have just launched the schooner TURNER, built for N. E. Turner, Vinegar Bend, Ala., and sold by him to a South American company. TURNER is 185 feet long, 37 feet beam and 14 feet 8 inches deep. She cost \$125,000. Her place on the ways was taken immediately by the framework for a 2,000-ton steamer for the Gulf Export & Transportation Co., Beaumont, Tex.

Henry Piaggio, ship merchant and exporter of pine, has closed a contract for building six freight ships at his yards at Orange, Tex. The contract calls for

a total price of more than \$1,000,000 on delivery. Piaggio has reserved the right to charter these vessels from their owners, the freight rates to make each one practically pay for itself on one trip.

Gulfport, Miss., is to have a ship yard which will employ between 900 and 1,000 men, according to plans now being drawn up for Henry Piaggio. The yard will be capable of producing vessels of 300 feet length and up to 4,000 tons. Piaggio's firm now owns a number of ships under Italian registry and is planning to build several more.

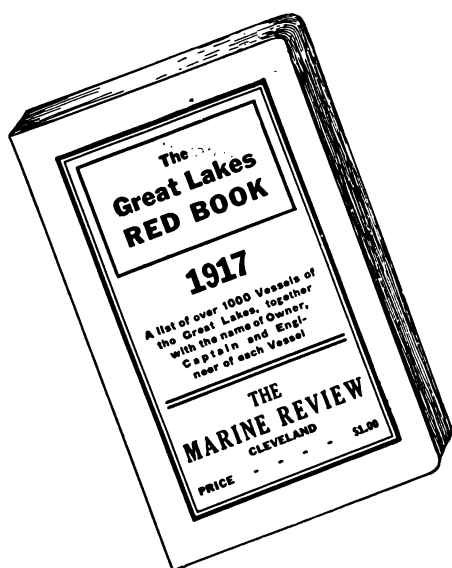
The Inland Navigation Co.'s steel, self-propelled barge, Inco No. 1, has just completed its thirteenth round trip between New Orleans and St. Louis. Full cargoes have been carried both ways on each trip. Two more barges are being added to the fleet.

Governor Sidney J. Catts of Florida announces that he will issue a call for a meeting soon of governors of all the Atlantic and Gulf seaboard states to devise means to dig a ship canal across Florida. Such a canal would shorten ship communication between New York and the Panama canal by 1,000 miles.

The state harbor board of Alabama has closed a contract with the Terminal Transfer & Storage Co., Mobile, La., for the transfer of the Hieronymous docks property to the board. With this property as security, the board will issue \$500,000 in bonds with which to erect terminals and docks. The Ferro-Concrete Construction Co., Cincinnati, will do the work.

Just Off The Press!

The Great Lakes Red Book for 1917



Actual Size 3" x 4 3/4"
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If you want to know who's who and what's what on the Great Lakes this season, you need The Great Lakes Red Book for 1917—the fourteenth annual edition.

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It lists all the vessels plying the Great Lakes, and gives the names of the owner, the captain, and the engineer of each boat. The vessels are listed twice—once in a list arranged alphabetically according to the names of the boats—once in a list arranged by fleets and owners.

The Great Lakes Red Book also contains a separate list of the ore carriers, showing the capacity of each, and a list of the supply houses, fuel docks, repair men, etc. at each port.

It is the only directory of the Great Lakes and is indispensable to every man in any way connected with it.

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Equipment Used Afloat and Ashore

Portable Saw Rig for Use in Ship Yards

THE vital importance which wooden ships have assumed in aiding this country in successfully prosecuting the war, has led to a strong demand for woodworking equipment. This demand has been growing steadily as new yards have been organized or projected, and old yards expanded. In addition, the large number of steel ships under construction has caused a wider use of woodworking equipment in finishing cabins, decks, etc.

The C. H. & E. Mfg. Co., Milwaukee, Wis., has been manufacturing for some time, a portable saw rig especially adapted for work in ship yards. This outfit is a complete portable woodworking mill, self-contained and ready to operate anywhere. It is designed also as a shop tool to take the place of separate machines for the different kinds of mill work. Four operations can be carried on simultaneously. Each attachment is said to have as much capacity and is said to do as accurate work as an independent machine. The rigs are built in six sizes, with the power built in and under the table.

The frame construction of the portable saw rig is structural steel. The lower members or skids are 3-inch angles reinforced with $3\frac{1}{2} \times 3\frac{1}{2}$ -inch timbers. The legs and upper members are $2\frac{1}{2}$ -

inch angles. The table is a $\frac{1}{4}$ -inch steel plate, 42 inches wide and 56 inches long, bound around the edges with a $1\frac{1}{4}$ -inch angle. The table is hinged to the rear of the frame. It is raised and lowered at the front by a raising screw, and is locked at the front corners by brackets and hand nuts. A removable throat piece permits the saws to be changed without raising the table. The saw and jointer gages are iron and steel. The rip and jointer gages are adjustable from square to 45 degrees and can be readily locked in any position. The arbor is steel. The long bearings are lined with bearing metal and are wick oiling, with large oil wells cast under them. The arbor is fitted with a collar to take up the end play. The diameter of the arbor where the saw fits, is 1 inch.

Band Saw Attachment

The frame of the band saw is a 1-piece casting channel section. It is mounted on the extension of the skid and is braced to the end of the saw frame. The wheels are iron, faced with rubber bands. The upper wheel can be tilted for aligning the blade as well as adjusted vertically to give the proper tension to the blade. Any size of blade up to $\frac{3}{4}$ inch in width can be handled.

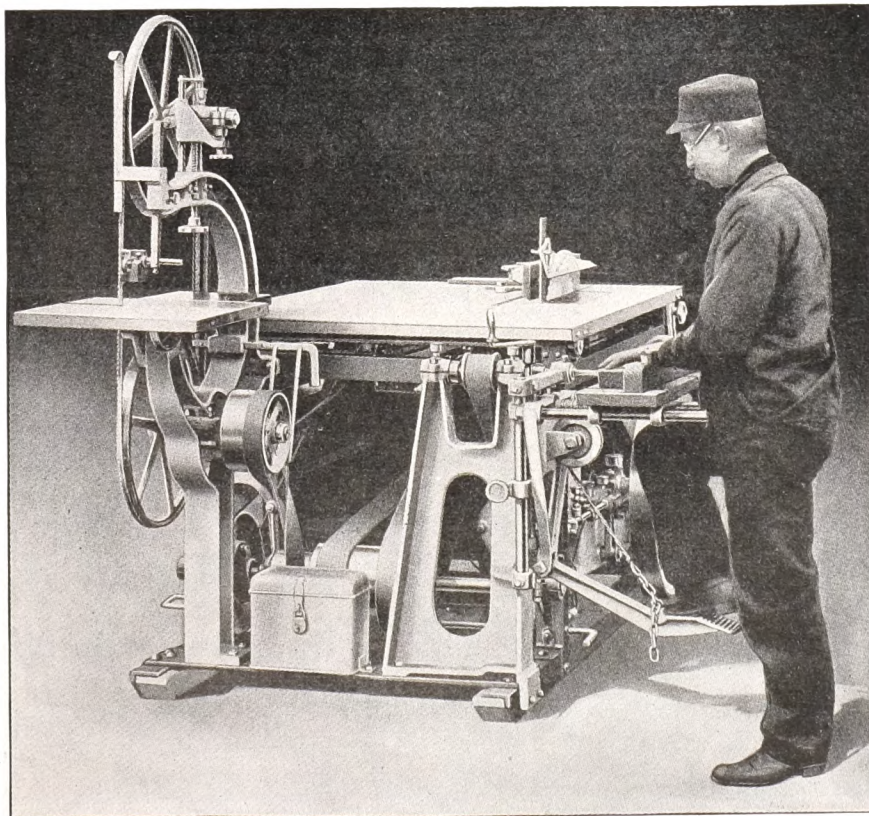
The table is iron and is $18 \times 18\frac{1}{2}$ inches. It can be tilted to any angle up to 45 degrees and locked in position. The guide bar is steel, and is fitted with a roller guide. The drive is by belt from the countershaft to a tight and loose pulley on the band saw. The saw is started and stopped independently by means of its own belt shifter. The horizontal capacity is 20 inches and the vertical capacity 8 inches. The height of the table from the floor is 41 inches.

The frame of the saw rig boring and mortising attachment is a 1-piece casting, bolted and braced to the saw frame. The arbor which carries the bits is belt driven from the countershaft. The table is 22 inches long and 8 inches wide and has a vertical adjustment of 7 inches through a removable crank. It slides up and down on steel rods and can be clamped at any height. It has a horizontal travel of 8 inches by means of a foot pedal, being automatically returned by a spring. The gage can be set at any angle. An adjustable stop regulates the depth of the boring or mortising. This attachment is designed to cut mortises up to $\frac{3}{4}$ -inch in any length and to bore holes up to $1\frac{1}{2}$ -inch diameter.

The jointer of this portable saw rig has its main frame shaped to fasten rigidly on to the side of the saw frame. The frame is a 1-piece casting with planed inclines on which the tables are mounted. Both tables are adjustable and are 40 inches long. The front table has a rabbetting arm extending over the bearing. The fence is carried on the front table and is adjustable across the table to the full width of the knives. It is adjustable to any angle up to 45 degrees and can be securely locked in position. The head is cylindrical and carries four $6\frac{3}{4}$ -inch knives. The head is covered by a safety guard which uncovers the knives to the width of the stock and automatically returns as the stock leaves. The jointer is stopped and started by means of a friction clutch on the countershaft.

The C. H. & E. Mfg. Co. advises that this outfit is being used by a number of ship yards, including the Chester Ship Building Co., Chester, Pa., the New York Ship Building Corporation, Camden, N. J., and the Pennsylvania Ship Building Co., Gloucester, N. J.

A. B. Walton, for 14 years chief electrician at the Lorain, O., yard of the American Ship Building Co., has organized the Walton-Doane Electric Co. at Lorain, power and lighting specialist.



PORTABLE SAW RIG